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Editorial Notes

Glasgow

THE comparative quiescence, as regards meetings and conferences, which usually settles upon the Gas Industry following Institution Week in the early summer has been disturbed this year, and large numbers of gas men—and women—uprooted themselves last week for the journey to the Glasgow Exhibition. Our confrères in Scotland can well regard the numbers as a compliment not only to their particular efforts in connexion with the Empire Exhibition, but as a mark of esteem for the progressive manner in which they carry on their business, often in the face of serious difficulties. If we may be permitted to say so, it was not only a very large, but also a very distinguished, gathering, and congratulations may also be extended to the British Gas Federation which once again showed its great value in organization by being able to draw together all sections of the Industry on occasions when a united effort is clearly called for.

The actual occasion was a day of the International Engineering Congress on which gas subjects were taken, and, if we regretted the close confinement of the Congress room for two hours when so many attractions outside were calling, at least we had to be thankful for a focal point which called us all together in Glasgow on the same day, and for the interesting subject matter of the two Papers. Mr. John Keillor, of Vancouver, supplied the international element, and his really interesting account of the circumstances in which gas is found, manufactured, and distributed in British Columbia was far more appropriate to the atmosphere of the meeting than would have been a Paper purporting to teach us how to improve our home Industry either technically or commercially. Sir David Milne-Watson's Paper, after a glimpse into the past and present of the Industry, gave another wholly admirable summary of its natural position in the future fuel policy of the nation, if the nation should ever adopt a policy of any kind before its fuel resources are exhausted. The pity was that a glance around the audience revealed about one hundred per cent. of familiar faces, and made it clear that the Congress, at any rate for this particular session, was neither "international" nor in any general sense "engineering." As far as Sir David's excellent Paper was concerned, it was a case of the converted being still further confirmed in their faith. We hope that by some means or other it may have achieved, or may achieve, a very much wider hearing.

Sir David's Paper is reported in later columns to-day, while that of Mr. Keillor will be dealt with in an early issue. In addition there will be found a general account of the Industry's part in what is undoubtedly a beautiful exhibition. Full advantage has been taken, in laying it out, of the natural features of the site, and among many features which stand out prominently on the gentle slope the gas pavilion is strikingly situated, leaving no doubt that the Committee who organized the Industry's effort looked after its interests well in this respect. The exterior and interior design are good, and cookery demonstrations are playing to full houses. Rightly or wrongly—a question which was much discussed—no attempt has been made to go beyond the display of appliances which is to be seen in any well-appointed gas showroom. We can sympathize with those who hold that a prestige story could have been told worthy of the excellent site which the pavilion occupies. On the other hand, the appliances are admirably displayed, and it can well be argued that the ordinary visitor to an exhibition has no time to absorb prestige stories.

The B.G.F. industrial gas exhibit is a wonderful display, and the thanks of the Industry are due to all who are participating in it. One must also heartily congratulate the Women's Gas Council upon the excellent use they have made of the comparatively small space available to them. Apart from the attraction which Miss Halpin's display appears to hold for Royalty, we understand she has had at least one enquiry from a couple (nationality unrecorded) contemplating matrimony as to the second-hand value of her model kitchen for removal complete to a new house. With our final word of gratitude to the Scottish Gas Industry for all they have done in the good cause, a special note must be made of the Glasgow Gas Department upon whom naturally much of the strain has rested. Something of their achievement is recorded elsewhere in this issue.

Another Oil from Coal Report

IN July of last year a Special Advisory Committee of the Labour Party was appointed to enquire into the production of oil from coal. The report of this Committee has now been published, and it is pointed out that it was completed before publication of the Falmouth Report—Report of the Sub-Committee of Imperial Defence on Oil from Coal—an abstract of which was published in the "JOURNAL" for Feb. 23 and which was the subject of comment in the same issue. If, from the economic point of view, the present document is not particularly convincing, it is one of very great interest. The Labour Party Committee admit—as, indeed, everyone must acknowledge—that the present cost of producing oil

from coal is much greater than the cost of importing it, but hold that special measures to encourage the production of oil from coal are worth while because in their opinion the gap between the cost of producing oil from coal and the cost of importing it will diminish as the coal-oil industry develops; because a native coal-oil industry would mean a new market of wide dimensions for coal and would give employment to a considerable number of miners; because the production of oil from coal would to some extent correct an undesirable excess of visible imports over visible exports; because the production of oil from coal, though not imperatively required in the interests of national defence, would be a useful supplement to imported supplies, which are liable to many hazards in time of war, and to storage; and because they think there is some reason to believe that natural supplies of oil may approach exhaustion within a measurable future.

To our mind the report of the Falmouth Committee was an extremely well balanced and closely reasoned argument concerning the problem from the point of view of the nation: and in no way did it suggest that further investigation in this country into processes of making oil from coal should be discouraged. The Committee recommended, it will be recollected, that a guaranteed rate of preference of 8d. a gallon—this preference has since been increased to 9d. a gallon—on home-produced oils should hold till 1950. In the opinion of the Labour Party Committee the Falmouth Report was throughout solicitous for the oil industry (in the House of Commons last week a Labour member said that the report could not have been better written for the oil interests if it had been commissioned by them), whereas the Labour Party Report, "considering the best interests of the nation as a whole, is permeated by a desire to see the fullest use made of British coal reserves." Those who found the Falmouth Report negative—though it does not appear to us that a twelve-year guarantee of a preference of 8d. a gallon on home-produced oils is negative—may find the Labour Party Report more stimulating. The thoughtful British taxpayer will weigh up very carefully the arguments advanced.

Low-Temperature Carbonization

Oil storage, the report points out, is a feasible method of preparation for a national emergency. It is feasible to build underground tanks holding a year's supply, and "the cost could be regarded as a small premium to pay for security in this vital matter." This being so, it cannot be argued that the production of oil from coal is absolutely essential in the interests of national defence, but the Committee's point is that the production of oil from coal would be a valuable adjunct to other sources; and "even though oil from coal costs more in time of peace than imported oil, this might not be so in time of war, when the price of imported oil would rise sharply." Hence, they urge, the State should take steps to establish an oil from coal industry, and as part of their scheme they recommend that the State should build, either by itself or in combination with private enterprise as the particular circumstances may dictate, five low-temperature carbonizing plants at an estimated cost of £1,250,000 and capable of treating 950,000 tons of coal annually.

The Falmouth Committee, it will be recalled, gave the fullest and most careful consideration to the prospect of a really large-scale development of low-temperature carbonization and came to the conclusion that the low-temperature carbonization process is first and foremost a coke-making process and that its value depends on the remunerative disposal of its solid smokeless fuel. At the moment low-temperature coke finds a ready sale even at a price per ton greatly in excess of that of gas coke—in fact, higher than that of the best house coal procurable. There is, however, no assurance that there will be a really large market for such a high-priced fuel. In the view of the Falmouth Committee "low-temperature carbonization must in the light of existing information be ignored as a possible major source of indigenous oil supply. To the extent that low-temperature carbonization can develop on normal lines it will, like the other carbonization industries, make a contribution to the problem of smoke abatement and efficient fuel utilization, and at the same time will provide some addition to the country's supplies of home-produced oils." The Labour Party Committee state that the open fire has physiological and psychological merits which cannot be gainsaid, and maintain that low temperature coke satisfies the demand for smokeless open fires. They make no mention, however, of the developments which have taken place to render the use of high-temperature coke in the open grate eminently satisfactory and exceedingly economical.

As we have said, however, the low-temperature carbonization plants are but part of the Labour Party Committee's composite scheme, which in addition recommends the building of half-a-dozen synthesis plants, estimated to cost £11,400,000 and capable of treating annually 1,100,000 tons of coal, yielding 51,000,000 gallons of motor spirit, and one hydrogenation plant, with a yearly output of 45,000,000 gallons of motor spirit, estimated to cost £5,000,000. The Falmouth Committee, it will be remembered, estimated the cost of a coal hydrogenation plant of a similar capacity at £8,000,000. The Labour Party Committee argue that with their scheme the low-temperature tars from the envisaged plants would be available for hydrogenation and that consequently the capital cost of a hydrogenation plant for treating coal, low-temperature tar, and creosote would be £5,000,000 and not £8,000,000. The plan envisaged, then, involves an estimated capital cost of £17,650,000, and it is contended that it would put into employment 6,800 miners and 4,750 workers on the plants themselves.

The Economic Aspect

The Committee further argue that for some years to come there is likely to be an annual increase in the demand for oil and motor spirit, and if domestic production does not exceed this annual increase, there will be no diminution in the receipts to the Exchequer from the tax on imported petroleum products. The Government, though, in the light of other budgetary requirements, should, they consider, set a maximum on the total preference granted. Now in 1937 the production from indigenous materials of oils which, if imported, would have been subject to a duty of 8d. a gallon amounted to about 130 million gallons. Had this output been subject to duty, the yield to the Exchequer would have been £4,300,000. It may be—the figures have not been disclosed—that part of this output was produced at a loss. The Labour Party plan would place a further 100,000,000 gallons of home-produced motor spirit on the market; and the indications are that the Revenue would have to accept not only a further loss of duty of £4,000,000 but also a considerable loss on every gallon of spirit produced. The scheme would, it is true,

afford employment for about 11,500 men; on the other hand—and sight is too often lost of this—importation of oil provides employment in the building and operation of tanker vessels. The additional miners would be employed at a loss at the expense of profitable employment in the shipbuilding yards. The answer as to who would foot the bill needs no elaboration.

"The fact is," states the report, "that the coal-oil industry will be developed on the big scale either by the Government or not at all." While holding this view the Labour Party Committee's Report makes it clear that the Party does not desire to see the production of oil from coal formally prohibited to private enterprise. "While wholly unimpressed by the argument that the State should never shoulder industrial risks, the Labour Party has no desire to thwart the activities of pioneers who are prepared to shoulder similar risks. There is need in the coal-oil industry, as in all pioneer industries, for inventive genius and creative ideas. . . . If an inventor's ideas do not commend themselves to the State officials, for what may seem at the time good reasons, there is no reason why he should not be given the chance to test them at his own risk and the risk of those he can persuade to back him. . . . Private firms must expect no financial assistance beyond that afforded by the general preference on home-produced oils, but arrangements should be made for giving assistance for approved items of research—*e.g.*, by the loan of officers from the Fuel Research Station. In return for the preference, private firms must submit to a measure of public control and supervision. . . . The State must have the right at any time, with due notice, to acquire private processes and plants at a fair valuation; and the time should be envisaged when the State will own and operate all processes and plants for the production of oil from coal."

The Committee contend that, as far as the hydrogenation plant is concerned, the Scottish coalfield has the best claim and that South Wales is the obvious place for a big development of the synthetic process. It is suggested that four plants should be established at widely separated points, that a fifth synthetic plant should be set up in Cumberland, and a sixth in Lancashire. As far as the low-temperature carbonization plants are concerned, the view is put forward that two plants should be established in Lancashire, "where the smokeless fuel might be welcomed by the large populations of Liverpool and Manchester," one plant in Cumberland, one in Scotland, and one in south-west Durham. It is also recommended that the extraction of benzole should be carried out at all gas-works where it is practicable, and that Government influence be used to that end, that cannel should be left as a reserve, and that to encourage the use of gas as a motor fuel the weight of the cylinders be not included in the weight of the vehicle for purposes of taxation. A further recommendation is that the Government provide the Fuel Research organization with a capital sum of £250,000 for development and that its annual income should, over a period of years, be brought up to £250,000.

In regard to the smoke nuisance, the Committee were impressed with its magnitude, and considered that the widespread use of low-temperature coke would mitigate the evil. The barrier to its greater adoption is its high price, and "until the price can be substantially reduced it is not proposed to recommend a ban on the burning of bituminous coal in the raw state." As we have said, the Committee ignore high-temperature coke, which at the moment can replace raw coal without involving the consumer in any added expense

Promotional Tariffs Essential

WHILE it covered much other ground, the Presidential Address of Mr. D. D. Melvin at the Annual Meeting of the Waverley Association of Gas Managers dealt mainly with distribution, pricing, and marketing topics. He spoke in no uncertain manner of the urgent need for the adoption of promotional tariffs if we are to gain new business, and he referred particularly to the development of the gas water heating load, of which as yet we have only touched the fringe. Some progress, it is true, is being made on the flat rate basis of charge, but it is negligible in comparison with what could be accomplished if the running cost could be quoted in terms competitive with solid fuel, taking into account the added advantages of gas. The potential water heating load warrants terms of this order. The Edinburgh Gas Department has for some time had in operation a block system of charge, and can record an increase in recent years of that all-important consumption per consumer figure. The scale, as amended in 1935, was given in the Address. After a first block of 5,000 cu.ft. at 6·947d. per therm, the price drops for the second block to 5·789d. per therm, and so by a series of blocks to a figure of 3·789d. per therm. The logical development of the scale, said Mr. Melvin, might have been gradually to reduce the blocks, with the exception of the first, until gas was available at about 4d. a therm to all. The development has necessarily received a check as a result of rising coal costs and other costs; and the Department now has under consideration the introduction of a two-part tariff with a commodity rate of not more than 3·5d. to 4d. a therm—"a business risk," remarked Mr. Melvin, but one "which it is perfectly justifiable to take. . . . Even if a scale can only be framed to cater for a percentage of the consumers in case of financial loss, one should be adopted and extended as circumstances permit until the 3d. or 4d. per therm can be talked of generally."

On the matter of cost of coal Mr. Melvin called attention to increasing costs being accompanied by deterioration in coal quality and the inability to obtain the types of coal which have been shown to give the best gas-making results. The Edinburgh Gas Department has been compelled to buy at increased prices coals not well suited for blending, with consequent increases in cost of gas production out of all proportion to the increase in the cost of coal. Not only this. There is also the question of delivery, which is such that stocking and withdrawal have become part of ordinary routine, adding to handling costs; and, with Scottish coals, storage for even a limited period results in heavy depreciation in gaseous yields and particularly in coke producing qualities. Mr. Melvin urged as a remedy to an unhappy situation insistence on a definite specification of coal size, ash content, moisture content, and quality, with adequate penalties. Councillor Walter Muter, Convener of the Edinburgh Utilities Committee, has, of course, done yeoman service in voicing on many important public occasions the Gas Industry's dismay at the situation with which it is faced as a result of the operation of the coal selling schemes.

Encouraging Results

WHILE the City of Edinburgh covers an area of 50½ square miles the gas supply area covers over 116 square miles, gas being at the moment actually supplied over an area of 53½ square miles. Mr. Melvin's Address included a description of the distribution system and its problems and development in recent years. He mentioned that all the villages to which

a gas supply has now been provided have had an electricity supply for some years, but in every instance the introduction of gas has met with the most encouraging results. Out of 776 premises canvassed, for example, 740 have been connected to the gas mains, all houses have taken cooking appliances and many orders have been received for gas fires. This is a story to reinforce many similar ones when gas has been made available—or, rather, we should say modern gas service has been made available—in areas served for some time by electricity. There could be no better argument for the advantages of gas in the home.

On the production side Mr. Melvin spoke of the advantages to be gained by the careful compilation and correct interpretation of statistics, and in an Appendix he gave figures relating to 1912 and 1937, showing how in this 25-year period, in spite of a wages increase of over 100% in the case of stokers and 150% in the case of labourers, and a "net cost of coal" increase of 166%, the net cost of gas into holders—which in 1937 was just over 2d. per therm—increased by only 37%. This is eloquent of the improvement effected in gas making plant and the standard of skill in operating the plant. Also on the production side, it was natural that Mr. Melvin should refer to the highly important work undertaken by the Edinburgh Gas Department in collaboration with the Fuel Research Board into the carbonization of cannel in vertical retorts. The results of this work have, of course, been communicated to The Institution of Gas Engineers by Mr. Jamieson and Dr. King and have aroused widespread interest. Although at the time of these experiments cannel was 25% dearer than the average cost of coals normally used, the net cost of production per therm was slightly less when the products were assessed on the same basis. During the discussion on his Address Mr. Melvin explained that at the present time cannel costs 10% more than bituminous coal from the same area and the Department is using 10,000 tons annually. There would appear to be a case for detailed exploration of the reserves of cannel.

Competition in 1847

With the subject of competition from electricity necessarily occupying the thoughts of the personnel of the Gas Industry it is interesting to look back for a moment to the type of competition which prevailed between gas companies in the early days of the Industry. We think that the following extract from a letter on "The Evils of Competition" published in the *Gas Gazette* of June 10, 1847, will amuse our readers: "I will admit at once," observed the correspondent, "that there have been cases where competition has been *temporarily* beneficial to the gas consumers—that there have been instances of shortsightedness and of mismanagement, nay, even of indifference to the interests of the consumers, and where competition was consequently not only called for but rendered imperative. I assert, however, without the slightest fear of successful contradiction, first, that such cases have been the exception, not the rule; and the mischief has arisen from the directors and proprietors not being able to foresee or to imagine the possibility of the illimitable increase in the consumption which would result from the successive reductions in price. Secondly, that the consumption of gas at a very reduced price (when *all* sold by meter) having very greatly exceeded the anticipations of nearly all men in authority, and thereby rendered that clear which formerly was at the best problematical, and by many sincerely believed to be a monstrous absurdity, the time has gone by—past for ever—when such mistakes can occur again. And thirdly, that like some quack medicines, the 'remedy' but renders that disease incurable which was previously only accidental and temporary. This latter is so self-evident that I cannot find words to express my surprise that it should still be a question. The fact is—and I say it advisedly—it has latterly been a mere question of time with the metropolitan gas companies as to when certain reductions should be made; and there is no one truth more certain than this—namely, that for some time back the introduction of new companies has retarded rather than accelerated reductions in price. In fact, it is notorious that had it not been for the excess of competition we should at this moment be supplied with gas throughout the whole length and breadth of the metropolis at 5s. per 1,000 cu.ft., *or less*. And yet competition, *active competition*, is still recommended to us as a panacea for the cure of the very evil it is perpetuating."

Forthcoming Engagements

June

30.—Southern Association (Eastern District).—County Meeting at Croydon. Inspection of Works and William Cash Workshops and visit to Croydon Aerodrome.

30.—I.G.E.—Joint Committee on Complete Gasification under Pressure, 2.30 p.m.

[*No meeting of the Central Executive Board of the National Gas Council will be held in June.*]

July.

1.—Manchester Association.—Visit to Liverpool Gas-Works and Showrooms. Luncheon at Adelphi Hotel at invitation of Chairman and Directors.

4.—I.G.E.—Research Executive Committee, 2.30 p.m.

5.—B.C.G.A.—Executive Committee, 11 a.m.; General Committee, 2.30 p.m.

5.—I.G.E.—Joint Lighting Committee, 2.15 p.m.

11.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.; Benevolent Fund Committee of Management, 4.30 p.m.

12.—I.G.E.—Council, 10 a.m.

12.—N.G.C.—Central Executive Board, 2.30 p.m.

19.—I.G.E.—Gas Education Executive Committee, 11 a.m.; Gas Education Committee, 2.30 p.m.

19.—S.B.G.I.—Council Meeting, 56, Victoria Street, 2.30 p.m.

22.—I.G.E.—Liquor Effluents and Ammonia Committee, 11.15 a.m.; Joint Research Committee, 2.30 p.m. (*Transferred from June* 24.)

August.

9, 10, and 11.—Irish Association of Gas Managers.—Annual Meeting in Dublin.

Amalgamation and Grouping

Middlesbrough and Stokesley.

Stokesley Rural Council has decided not to object to the application of the Middlesbrough Corporation to the Board of Trade for sanction to purchase the Stokesley Gas Company and to extend the service to about 15 villages in the area.

Wellingborough and Wollaston.

The Wollaston Gas Coal and Coke Company, incorporated in 1869, is to be merged with the Wellingborough Gas Light Company, subject to the consent of the Board of Trade. It is considered that the amalgamation will benefit consumers and shareholders, and, with the exception of the gasholder, the plant at Wollaston will be dismantled and gas supplied from Wellingborough.

Personal

In succession to Mr. W. C. Campbell, whose appointment as Engineer and Manager to the Galashiels Gas Light Company was recently announced in these columns, Mr. H. KEILLOR has been appointed Engineer and Manager of the Buckie Gas Light Company. Aged 26, Mr. Keillor has been Works Superintendent at Hamilton during the past year, having previously been with the Greenock Gas Department.

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The Directors of the Caledonian Gas Corporation, Ltd., announce the appointment of Mr. DUNCAN CAMPBELL as Manager of the Corporation as from June 1, 1938. They also announce the appointment of Mr. E. B. CRADDOCK (late of the United Kingdom Gas Corporation, Ltd.) as Chief Technical Assistant to the Corporation.

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The marriage took place on June 23, at the Fuller Baptist Church, Kettering, of Mr. RICHARD LESLIE MADDOCKS, Assistant Engineer of the Kettering Gas Company, of which his father is Engineer, Manager, and Secretary, and Miss Betty Chater, also of Kettering.

Obituary

EDWIN H. HUDSON

The Gas Industry in Yorkshire suffered a severe loss on June 21 by the death of Mr. Edwin H. Hudson, who, for 50 years, was Engineer, Manager, and Secretary of the Normanton Gas Company. He relinquished this office a little over a year ago, when he was appointed Chairman of the Company.

Mr. Hudson was a man of conspicuous ability and charming personality, whose services to the Gas Industry were universally recognized and appreciated. He exercised great influence in the counsels of the Industry, not only in Yorkshire, but as a member of the Central Executive Board of the National Gas Council and of the Central Committee of the Federation of Gas Employers for the past 15 years. His advice and counsel, which were always so well expressed, were received with great respect. For a similar period, Mr. Hudson was Deputy-Chairman of the Yorkshire District Executive Board of the National Gas Council and of the District Committee of the Federation of Gas Employers. In connexion with the former, he was appointed Chairman of the Gas Industry Representation on the District Joint Consultative (Gas Coal) Committee for the Midland Amalgamated District.

Mr. Hudson also rendered valuable services as a member of the Yorkshire (West Riding) Regional Joint Industrial Gas Council since its inception in 1920. In this capacity his influence was always for mutual and amicable co-operation between employers and employed, and on many occasions his ability as an arbitrator on labour questions was of great value. In this sphere of his activities he will be greatly missed.

Mr. Hudson also devoted his outstanding ability and personality as Chairman of the Yorkshire Commercial Section of Gas Undertakings for the past 12 years, and for a similar period as Chairman of the Yorkshire Joint Tar Board. In connexion with these important bodies, as in all other associations, he gave unstinted service, and his charming disposition and personality endeared him to every member.

Only a year ago, on his retirement from the position of Engineer, Manager, and Secretary of Normanton Gas Company, his many friends honoured him as their guest at a Dinner in recognition and appreciation of his long and valuable services to the Industry, and a presentation was made to him of a silver tea service and tray as a memento of the occasion.

Mr. Hudson was a Director of the Mirfield Gas Company and Managing Director of the Pocklington Gas Company. He was Past Master of Sincerity Lodge (1019) Wakefield, and P.P.G.D. of West Yorkshire Province.

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As we go to press we learn with great regret that Mr. A. T. WATSON, Engineer and Manager of the Rushden and Higham Ferrers District Gas Company, died very suddenly at midnight on Sunday last, June 26, at Henley-in-Arden, Warwickshire, at the age of 56. Mr. Watson was born in Gibraltar and later came home to Scotland. He served his apprenticeship with Messrs. R. & J. Dempster, Ltd., subsequently obtaining a position with the Wellingborough Gas Light Company, Ltd., as Works Manager in 1900. In 1924 he succeeded his father as Engineer and Manager at Rushden.

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The death took place on June 20 of Mr. FREDERICK R. SNOOK, who had been a Director of the Portsmouth and Gosport Gas Company since January, 1936.

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The death occurred at Manchester on June 23 of Mr. H. N. BARROW, J.P., who had served on the Justices Gas Meter Testing Committee for the past 25 years and of which he had been Chairman for the past 19 years.

Holding Companies as Instruments in Regional Planning

In this short article "Co-ordinator" discusses the possibilities of regional marketing and the establishment of a uniform system of promotional tariffs as the result of holding company control.

Holding companies in the Gas Industry are now an accepted fact. The five main companies of the new order in service within the United Kingdom control a total gas output of some 21,000 million cu.ft. per annum. The rapid growth of the movement to its present dimensions indicates that some unifying medium in the shape of practical amalgamation, as distinct from a rather hazy association within a large Industry, was not only required, but, when it appeared, was welcomed.

Holding companies, as they are at present understood, appeared about the time when the first general flush of the intense electric competition became indicative not only of present but of future rivalry in fields previously regarded by many as staple sources of gas revenue. Additionally the effect of having to fight a competitor who, by the nature of the support guaranteed to him, made it practically impossible for him completely to lose naturally stimulated the tendency towards more practical cohesion.

The holding companies as we know them to-day are merely putting into effect an idea which the Gas Industry as a whole—while recognizing the need—had not the courage itself to explore and carry through. Whatever difficulties may have attended the initiation of the practice, there can be no gainsaying the good effect of the holding companies' work in making individual gas undertakings more "aware" of the presence of their neighbours in the Industry, thereby contributing something to its welfare from a very wide—possibly a national—point of view.

A large individual undertaking can carry through the work of unifying a group of undertakings of which it may find itself a natural nucleus. This has been done in many cases. It is obviously sound, and is so recognized by those associated with holding companies; it is, in fact, the basis of the holding companies' progressive service to the Industry and the method for co-ordination of administration and the provision of a common source of facilities, in both direction and practical equipment.

What the outside holding company can do further, however, is to view these isolated groups on a regional and national area basis, and provide similar co-ordinating influence and equipment within a large group organization.

The holding company should be able to provide from its administration not only specific practical assistance in all matters concerned with technical and sales problems, but should put into effect in administration all those schemes for the co-ordination of gas service to consumers, and consolidation of gas interests from the Industry's side, which became available for treatment in such a unique way, perhaps only, to the holding company.

The most fervent individualist would probably become alive to the wisdom of a movement if, on examining the condition of an Industry within a large area of the country, he were to find that through that movement there were no isolated units, but that the seemingly separate undertakings were all linked, if not physically, then by ties just as strong, all presenting their individual facet of a common front, and backed up by the resources of the same holding company.

Regional planning for utilizing the services of a holding company is obviously desirable. Even without reference to the map, there are well defined areas making up in total the whole of the country, which occur to mind because of their type. The acceptance by the holding companies of this principle of "zoning" is a fundamental if they are efficiently to carry out their function as co-ordinators. It should then be their aim to "soak" the area with all the practical aspects of gas service, to unify aspects of selling of appliances, both as to prices and in respect of purchase by rent, as to periods and interchange of accounts. The possibility of regional unification of gas commodity prices is well nigh out of range except within individual small areas of the region, but the method of charging is possible of standardization, in the form of a uniform type of promotional tariffs.

There is some justification for the idea that holding companies as regional co-ordinators may well form an excellent vehicle for a rational liaison with the suppliers of other forms of light, heat, and power, viewing comprehensively the problems of production and marketing of these necessities, whether within a region or throughout the country and with reference to the fullest service to the people and the truest economy in respect of national fuel resources.

One factor tending to retard the rate of progress of regional consolidation of gas service appears still to be present in the hesitancy of some undertakings to assume their full and proper responsibility within the scheme. It may well be that the exploration of the possibility of forming a regional executive body would remove even this difficulty from the path along which co-ordination through the holding company is progressing towards the end of a regional Gas Industry.

News of the Week

A.R.P. Demonstrations are to be arranged by the Liverpool Gas Company at Radiant House from August 2 to Sept. 2. Included will be a gas-proof room designed to show the public how poison gas can be excluded.

Mr. Sydney Larking, to whose Paper at the Annual Conference of the Institute of Municipal Treasurers and Accountants we referred last week, has been City Treasurer of Coventry for many years, and not of Cardiff, as was stated in our report.

The Wateringbury Gas Company, in pursuance of the Wateringbury Gas Order, 1929, give notice in the *London Gazette* that as from the third day of October, 1938, they will supply gas of a calorific value of 500 B.Th.U. per cu.ft.

Notice is Given in the *London Gazette* by the East Grinstead Gas and Water Company, in pursuance of the East Grinstead (Charges) Order, 1922, that as from the first day of October, 1938, they will supply gas of a calorific value of 460 B.Th.U. per cu.ft.

At the Eighteenth Annual General Meeting of the Welwyn Garden City (Herts.), Ltd., it was announced that the consumption of gas for industrial purposes in 1932 amounted to approximately 2¾ million cu.ft. In 1937 it amounted to no less than 26 million cu.ft. The Watford and St. Albans Gas Company supply the area of Welwyn Garden City.

The New Address of the Iron and Steel Institute and of the Institute of Metals will as from July 1 be 4, Grosvenor Gardens, S.W. 1—the respective Telephone Numbers being SLOane 0061 and 6233. The two Institutes will occupy separate offices but will share Committee and Reading Rooms, while the Libraries of the two bodies have been joined.

A Reduction in the Price of Gas has been decided upon by the Grangemouth Town Council to 3s. 4d. per 1,000 cu.ft. for ordinary meters and 3s. 6½d. for prepayment meters. The Town Council have also decided to grant increases and bonuses to the gas employees. The year's working of the Gas Undertaking has proved a very satisfactory one.

Six Months' Notice to the North-Eastern Electric Supply Company, Ltd., to terminate the existing agreement relating to the public lighting of Hebburn-on-Tyne has been given by the local Urban Council. In its place a ten-year contract has been adopted with the Newcastle-upon-Tyne and Gateshead Gas Company for a street lighting scheme which will be completed and in full operation by July 1, 1939.

The British Gas Federation were among the exhibitors at the Annual Show of the Highland and Agricultural Society at Dumfries with a Pavilion having a frontage of 20 ft. In conjunction with Dumfries Corporation Gas Department, the Federation staged a display of modern gas appliances for domestic and industrial use. The stand was attractively equipped and acted also as an information bureau. Mr. S. C. Johnstone, Engineer and Manager of the Dumfries Gas Department, gave the Show authorities every support, and all the public catering was done by gas.

A Successful Gas Exhibition was held by the Houghton-le-Spring District Gas Company in the Miners' Hall, Houghton-le-Spring, from June 13 to 17. No fewer than 687 persons attended the exhibition during the week—an average of 69 per session. The recipients of the first and second prizes for the Cake Baking Competition were Mrs. Moore, of Fence Houses, and Mrs. Fenton, of Houghton-le-Spring. The Exhibition was opened by Mrs. J. M. Jones, of the local Town Women's Guild, and the Cookery Demonstrations were conducted by Miss E. Sanderson, of the Radiation Research Kitchen.

In the City of Glasgow Pavilion in the Empire Exhibition on June 20 the Hon. Neville Berry, son of Lord Kemsley and a Director of Associated Newspapers, Ltd., was presented with a cheque for £100 in aid of the Markham Colliery Disaster Fund, the proceeds of efforts made by the staffs of the Gas Pavilion and the City of Glasgow Pavilion. Handing over the cheque, Councillor P. J. Dollan referred in eulogistic terms to the splendid work for the fund which had been done by the staffs and to the excellent response of the public. Mr. D. Lawson, organizer of the Gas Industry's exhibits at the Exhibition, said the Gas Industry was peculiarly interested in coal and in those who laboured to produce it. When the disaster occurred they felt they must do something to show their sympathy for those who were affected.

Approximately 22 Acres of Land adjoining the gas-works have been acquired by Lincoln City Council for the use of the gas undertaking.

A Declaration of Calorific Value of 480 B.Th.U. per cu.ft., to take effect from Sept. 30 next, has been made by the Calne (Wilts) Gas Department in respect of certain parishes within their area of supply.

To Empower the Company to raise additional capital and to amend certain provisions of their Gas Act of 1913 are among the purposes for which the Titchfield District Gas Company intend to apply to the Board of Trade for a Special Order under the Gas Undertakings Acts, 1920 to 1934. Similar provisions are contained in a like Order for which the Crediton Gas Company intend to make application to the Board.

Definition of their Limits of Supply, authorization to charge differential prices, to define and limit the capital and borrowing powers, to establish a reserve fund, and to offer share capital for subscription by employees, are among the principal provisions of a Special Order for which the Crewkerne Gas and Coke Company intend to apply to the Board of Trade under the Gas Undertakings Acts, 1920 to 1934.

Daughter of Mr. Charles F. Botley, Engineer and General Manager of the Hastings and St. Leonards Gas Company, Miss Cecile M. Botley has just produced through her publishers, Messrs. G. Bell & Sons, a work under the title of "The Air and its Mysteries." In a foreword Sir Richard Gregory writes: "I know of no book the size and style of this small volume which brings together existing knowledge relating to the subject more successfully than has been accomplished by the authoress."

An Offer to Purchase the Llandudno Gas Undertaking was reported at the monthly meeting of the Urban Council on June 17. The Gas Committee stated that they were unable to entertain the proposal. This led to a discussion opened by Mr. A. Macfarlane, who asked how it was that a concern which only a year ago was described by the Committee as a "white elephant" had now become so valuable that its sale could not even be considered. He proposed that the matter be referred to a future meeting of the Council sitting in committee, and this was agreed.

An Increase of ¾d. per Therm in the price of gas to quarterly and prepayment consumers is announced by the Directors of the Watford and St. Albans Gas Company. This has become necessary owing to the substantial rises in the cost of coal and materials and to the increase in wages granted to the employees by the National Award. The increase in price will take effect as from the first reading or collection of the meters after June 30, 1938. The Directors point out that, to the average domestic consumer, the resulting additional cost of gas will be no more than approximately 1¼d. per week.

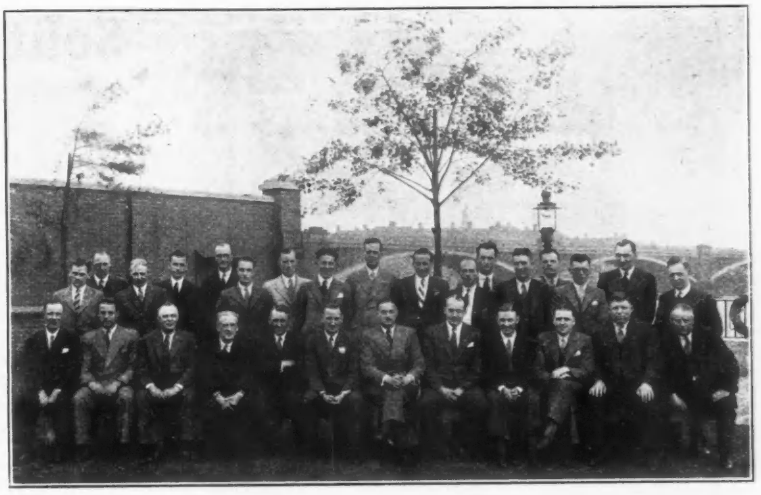
To Determine the True Temperature corresponding with the softening points of Seger cones it is necessary to make accurate measurements with an optical pyrometer. On Tuesday, June 28, at the Annual Inspection of the National Physical Laboratory, Teddington, a new gas-fired furnace was shown which enables the optical determinations to be made accurately. Pure alumina is used in the construction of the furnace, and the design of the gas burner has been improved so that a temperature of 1,900° C. may be reached without difficulty. Furnaces of similar construction are also used for firing the refractory vessels which are required for the work of the Metallurgy Department of the Laboratory.

The Need for More Modern Cookery Equipment in Eire schools was stressed by Mr. John McCann, a Director of the Alliance and Dublin Consumers Gas Company, at the annual distribution of prizes in connexion with the 1938 cookery competition for schools. The examiners reported, he said, that many of the schools required more modern equipment to give their pupils a really good chance in gas cookery instruction. This year 47 schools entered for the competition, a greater number than last; 2,945 students were examined as against 2,528, and the prize-winners numbered 553 as compared with 466, while the prize money reached £250 as against £210. This competition, promoted by the Company, has proved increasingly popular.

L.C.C. Summer School for Gas Fitting Teachers

The Summer School for Gas Fitting Teachers concluded, after a week of concentrated effort, when delegates with Mr. J. H. Currie, the Director of the Course, in the chair, attended a closing luncheon arranged by Dr. J. N. Long, the Principal of the Westminster Technical Institute. There is no doubt that the course was an unqualified success, and the gas teachers had ample opportunity to criticize and discuss the City and Guilds syllabus for Gas Fitting and many other points of interest in their work.

At the open discussion after the luncheon it was unanimously agreed that the course was well worth repeating during the next year, and votes of thanks were passed to Mr. Currie, representing the London County Council, to Dr. Burness, representing the Board of Education, and Mr. R. N. LeFevre, representing the Gas Light and Coke Company, for the work each had done in the preparation and carrying out of the course.



Our photograph shows members of the course on the water front outside Watson House—training centre of the Gas Light and Coke Company—at which the course was held by kind permission of the Directors of the Company.

Enquiry Into Coal Prices

The Committee on Methods and Costs of Distribution of Coal, Coke, and Manufactured Fuel held its first meeting (in private) on June 17, under the Chairmanship of Sir Walter Monckton, K.C., when its terms of reference and procedure were discussed. It is expected that the first public meeting of the Committee will be held towards the end of July, when it is hoped to hear preliminary evidence of a general nature from the Central Council of Colliery Owners as representing the producers of coal.

The Committee decided to communicate with a number of bodies interested in the distribution and use of coal, coke, and manufactured fuel, asking them to give evidence in due course. Any persons or bodies of persons who have not been specifically invited to do so, but wish to tender evidence to the Committee should communicate with the Secretary at Cromwell House, Dean Stanley Street, Millbank, London, S.W.1, indicating as fully as possible the information they wish to lay before the Committee.

Houses for Gas Workers

At a recent meeting of the Edinburgh Public Utilities Committee the suggestion was carried a step further that houses be built by the Edinburgh Gas Department for their workers.

It was stated by Treasurer Darling that a considerable number of the Department's workers lived at some distance from their work, and, although there were excellent travelling facilities, it might be worth while to enquire into the possibility of building houses for some of them. It would relieve pressure considerably of their housing work, and it was well within the scope of the Department. The Gas Manager and City Chamberlain might look into the possibility and consider building 40 or 50 houses on ground at their disposal.

Councillor Muter said that Mr. Jamieson was conversant with what had been done elsewhere, notably by the Gas Light and Coke Company in London. He thought they might usefully appoint one or two members of the Committee to visit that scheme.

New Showrooms for Stourbridge

We reproduce above two views of the attractive new showrooms which have recently been opened by the Stourbridge Corporation Gas Department. The attractive layout of the various appliances and the brightness imparted by the pleasing decoration scheme are features of the new premises, which should do much to stimulate the demand for gas in this part of Worcestershire.

Eltham's New Service Centre for the South Metropolitan Gas Company

Fine new showrooms, stores, and offices were opened for the South Metropolitan Gas Company at High Street, Eltham, S.E.9, on Monday, June 20. The opening ceremony was graciously performed by Mrs. Frank Harding Jones, wife of the President of the Company, and the occasion was marked by the presence of the Mayor of Woolwich and other prominent local residents.

Exterior View of the New Premises. A glimpse of the Stores and Office Building behind the Showroom can be obtained down the roadway on the left.

Not so very long ago the village of Eltham was entirely rural, and what is now a broad highway, forming a shopping centre for thousands of people, was a typical Kentish lane, flanked by orchards, farms, and gardens. But to-day Eltham has become all but swallowed up by the ever-expanding Metropolis. Nevertheless, it has still many relics of its historic past, and among the numerous pleasant old buildings that survived from more tranquil and spacious days was the Georgian house which, for more than twenty years, formed the headquarters of the district offices and showrooms of the South Metropolitan Gas Company at 113, High Street.

The rapid growth of the district, however, rendered these premises increasingly inadequate to cope with the corresponding expansion of the Company's business; and as the passing years had dealt hardly with the main structure of the original building it was wisely decided that the time had come to make room for modern premises designed to meet the demands of a new and growing Eltham.

In Harmony with Surroundings.

While the new showrooms have been designed by the Company's Architect, Mr. W. Watson, A.R.I.B.A., to the most up-to-date standards, care has been taken that they should not strike a discordant note with their surroundings. Gas was rightly deemed too trusted a servant of the district—which it has served for nearly a century—to obtrude a garish, quickly demoded building on so traditional a site. To this end, the Company have succeeded in maintaining something of the spirit of old Eltham, while at the same time sparing no effort to make the showrooms thoroughly up-to-date in every detail. The elevation of the building has been carried out in warm red brick and its clean businesslike lines seem to typify the inherent qualities of gas.

The main showroom, 50 ft. long by 25 ft. wide, is seen from the street through a non-reflecting window, and considering the difficulties imposed by the site in obtaining much natural light, the general impression, enhanced by the light wood panelling, is one of brightness and colour. On an attractive wooden block floor stand groups of four cookers in back-to-back formation, so that the less attractive rear view is unobtainable. Tables are available for the convenience of customers, while the counter is placed at the farther end of the showroom so that all who call to pay their accounts have to pass the full length of the floor. Low panelled balustrades project at intervals a short distance into the showroom at right-angles to the main walls, thus breaking the continuity of the latter and providing suitable settings for the display of gas fires and surrounds. The far end, opposite the main door, is given over to a comprehensive display of gas water heaters, a very striking treatment having been conceived—each appliance occupying a separate alcove while discharging into a common waste trough.

The lighting of the showroom is also very effective, being provided by attractive standard lamps, wall brackets, and pendant fittings, above which are shallow circular recesses in the ceiling embodying ventilating ducts.

The Demonstration Theatre.

A wide staircase leads to a "circulating area" or lounge on the first floor, where in addition to comfortable furnishings advantage has been taken to display further gas fires in natural surroundings. From here one gains access to the demonstration theatre, whose tiers of stainless steel framed seats provide accommodation for upwards of sixty persons. A considerable area of the ceiling takes the form of a large laylight, so that the room is particularly bright and airy. On either side, let into the pleasing dado of the walls, is a cabinet with sliding glass doors in which are displayed examples of the many tempting preserves which are prepared by the demonstrator.

The demonstration platform is conceived on thoroughly modern lines, with bright blue tiles accentuating the clean white finishes of the gas appliances and other equipment. Behind the demonstration theatre is a rest room for the showroom staff. The theatre is undoubtedly one of the features of the premises and in general effect is one of the most pleasing of its kind we have yet seen.

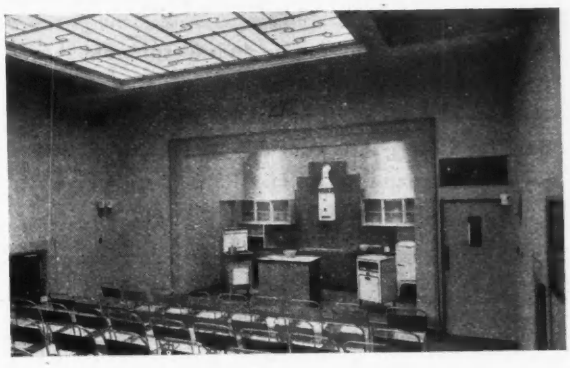
District Offices and Stores.

Occupying a site behind the showroom building are the district offices and stores, which have been designed as a complete and comprehensive unit to facilitate smooth and efficient working.

A General View of the Showroom.

The main office measuring 40 ft. square has a clear floor space. An important feature is the shadowless natural lighting obtained by carefully placed windows and roof lights. This quality is retained when gas lighting takes the place of daylight.

The stores, which are situated under the district offices, are approached by a main entrance designed to allow vehicles to



The Demonstration Theatre.

turn in and out easily. The entrance is flanked on one side by the timekeeper's office, and on the other by the foremen's office, and opens on to a wide yard from which the issuing counter is easily reached. This counter is under cover provided by the projection of the first floor of the building. A small workshop adjoins it.

The storeroom is fitted throughout with steel racks and bins, the higher ceiling in one corner providing accommodation for the longest lengths of gas barrel normally supplied.

In the yard are racks for bicycles and lockers for the use of fitters; these, too, are under cover. A separate staircase from the yard gives access to a fitters' lobby and wash room.

The general contractors for the buildings were Messrs. F. J. Moreton & Son, Ltd., of Gipsy Hill, S.E., and the shop fitting was done by Messrs. Pollards, of Clerkenwell, E.C.

The Opening Ceremony.

The opening ceremony was very charmingly performed by Mrs. Frank Harding Jones, wife of the President of the Company, in introducing whom, Mr. JONES expressed his appreciation of the presence of their guests on that occasion to help them start their new venture. They were very honoured to have the Mayor of Woolwich to give them his blessing, particularly because it was under the name of the Woolwich Gas Company that they had commenced to supply gas to the area nearly a hundred years ago. The President said he was very grateful to the Mayor and the other Councillors who had come there that day.

In declaring the new premises open, Mrs. JONES said she felt highly honoured to be deputising for so great a gentleman as Sir Kingsley Wood. Her husband, she remarked, was very proud of the fact that he joined the Company 27 years ago; but her own connexion with the Company went back much further, for her father's sister claimed that she used to go to school hand-in-hand with Sir George Livesey! It was a great pleasure to declare the new premises open.

Opportunity was taken of the opening of the new showrooms to present the prizes in connexion with the "Cooker Naming" Competition promoted by the Company. It was no easy task to adjudicate the winners, for there were no fewer than 3,366 entries. However, finally the name "Speedway" was selected as being the most suitable for the new cooker lately introduced by the South Metropolitan Company—and as "Speedway" was submitted by four competitors the judges decided to award four "first" prizes in the shape of new gas cookers, while six consolation prizes were awarded runners-up, which were presented by Mrs. Jones.

After an inspection of the new premises those present gathered in the general office for tea at the kind invitation of the President and Directors of the Company. Among those present, in addition to Mr. and Mrs. Jones, were Mr. B. R. Green, Mr. H. Gundry, Mr. A. B. Pasmore, Mr. V. Hewes, Mr. J. D. Payne, and Mr. A. Lee (Directors), Mr. A. H. Andrews (Chief Engineer and Works Manager), Major F. J. Bywater (District Manager and Comptroller), Mr. A. B. Seton (Gas Sales Manager), Mrs. A. L'Epine Smith (Lady Superintendent), Mr. L. F. McLeod (Distribution Engineer), Mr. H. M. Browne and Mr. A. Ridley (Local Managers), together with other Senior Officers of the Company.

A cordial expression of thanks for the Company's hospitality was moved by the MAYOR OF WOOLWICH (Councillor P. H. Rance, J.P.), who referred to the new building as a wonderful asset to Eltham High Street. He wished the Company every success in their new venture. The proposition was warmly supported by Councillor Capt. F. W. BEECH, J.P., L.C.C., who endorsed what the Mayor had said, remarking that the Company had put up a building worthy of the town and of themselves, and the best they could do that day was to wish them prosperity in their new endeavour.

Mrs. Frank H. Jones performing the opening ceremony. The President of the Company is on her left, and the Mayor of Woolwich on her right.

Mr. JONES, on behalf of the Directors and the staff of the Company, briefly responded, with an assurance of the Company's pleasure at the presence of their guests on that occasion.

Slough Company's New Artesian Well

The borehole of the artesian well at the Slough Gas and Coke Company's premises, Uxbridge Road, was completed on June 21, and a gathering of well-known engineers saw the first water delivered.

The borehole has been drilled by LeGrand, Sutcliff, & Gell, Ltd., by the clay rotary system, and has reached a depth of 1,102 ft. below surface, the lower greensand being struck at approximately 1,050 ft., and penetrated for a distance of 50 ft. Considerable interest is being taken at the present time in lower greensand boreholes, and the demonstration witnessed last week, which included a process known as "de-mudding," was unique, in many ways.

Among those who accepted invitations to attend were: Mr. A. V. Barraclough (Chief Engineer, Mid-Southern Utility Company, Aldershot), Mr. S. Harper Bill (Chief Engineer, Slough Estates, Ltd.), Mr. C. E. Boast (Croydon Borough Engineer and Surveyor), Mr. W. M. Cross (Ministry of Health), Mr. H. F. Cronin (Metropolitan Water Board), Mr. F. W. D. Davis (Port of London Authority), Mr. Tudor H. Davies (Metropolitan Water Board), Mr. F. H. Edmunds (H.M. Geological Survey), Mr. L. F. Hobbs (Chief Engineer, Rickmansworth and Uxbridge Valley Water Company), and Mr. A. Wilkinson (Assistant Water Engineer, Borough of Croydon). Mr. H. Wilkinson is the Engineer and Manager of the Slough Gas and Coke Company.

The borehole, which is 7¼ in. in diameter, was executed by means of the cable tool and mud flush system, of which the contractors were the pioneers in this country. Mud containing a special chemical solution was put into the hole, and by means of operations with boring tools sealed the walls of the borehole, doing away with the necessity of lining it with casing tubes. In a similar way the mud in the hole kept the lower greensand water in check, owing to the pressure from the surface down. The de-mudding process consisted of removing this mud and thus slowly removing the pressure and allowing the water to rise to the surface.

The top of the borehole had been piped, and when the water reached the surface, instead of rising skywards like a fountain, it poured from the end of the pipe into a tank. It is anticipated that a supply of between 10,000 and 20,000 gallons an hour will be delivered.

Fine New Showrooms for Romford Consumers

A fine central building, including splendid showrooms and demonstration theatre, was officially opened in South Street, Romford, on Wednesday, June 22, by His Worship the Mayor of Romford (Alderman Charles H. Allen), in the presence of a distinguished gathering.

The new premises occupy a commanding corner site in South Street, the principal shopping street of Romford, and face the main entrance of the L.N.E.R. and L.M.S. Railway Stations, which is used every day by many thousands of City workers.

The building has been designed in traditional Georgian style in keeping with the historic associations of the ancient market town of Romford. The external elevations are carried out in 2-in. hand-made rustic bricks, with Portland stone dressings to all doors and windows, wood sash windows, and a wide overhanging eaves below a pitched roof covered with red sand-faced hand-made tiles. This treatment combines to give that warm and mellow appearance which characterizes buildings of the true Georgian period. Internally the woodwork, panelling, and furnishings are carried out in Australian walnut, and scope has been given for cornices and decorative plasterwork. A prominent feature of the building are the main entrance doors and the doors leading to the Demonstration Theatre; these are in wrought and cast coinage bronze, well proportioned and of period treatment, while the interior doors are decorated with beautiful cast bronze grilles.

The building is of two storeys of which the whole of the ground floor is devoted to showroom purposes, comprising the main showrooms, cashiers and administrative offices, cookery demonstration theatre, model kitchen, and store room. A mezzanine floor surmounts the cashiers and other offices, providing accommodation for the staff, a store-room, and a cinema projection box. A rear basement houses the central heating plant, consisting of two Potterton "Rex" gas-fired boilers and one "Ideal" magazine gravity-feed boiler; the central heating plant has been designed with a view to demonstration purposes.

The main showroom, 52 ft. long by 36 ft. wide, occupies the front of the building, has expansive windows on two sides, and is fitted with revolving doors of plate glass and Australian walnut. A permanent feature of the showroom is the hot water display where a full range of water heaters, all in operation, can be inspected under working conditions. The whole of the wall space and also a centre plinth are utilized for the display of live gas fires in appropriate mantels and surrounds while cookers and all modern appliances occupy an uninterrupted floor space of polished teak blocks. Adioining the main showroom is the cashier's counter in Australian walnut with bronze grille and illuminated sign. A striking feature of the main showroom is the lighting, the general illumination being by ventilator lamps, while all the windows and the hot water display have concealed strip lighting; the lighting equipment was designed by Messrs. Wm. Sugg & Co., Ltd.

The Demonstration Theatre has a seating accommodation for 125 persons and is tastefully panelled in walnut. The ceiling is convex in shape and is covered with sound insulating material. The demonstrator's proscenium is fitted with a model built in kitchen cabinet, complete with refrigerator and sink water heater. In addition a permanent screen is provided affording facilities for cinema displays utilizing the latest forms of sound equipment.

The premises were designed by Messrs. Crowe & Careless, FF.R.I.B.A. Architects, 74, Great Russell Street, W.C. 1, in co-operation with the Company's staff. The general Contractors for the building were Messrs. Baker, Hammond, & Laver, of Rainham, Essex, and the showroom interior was carried out by the Nautilus Building and Decoration Department.

The Opening Ceremony.

Opening the proceedings, which took place in the demonstration theatre, Mr. BEVOUS J. SMITH (Chairman of the Company) welcomed the Mayor and Mrs. Allen, and said what a great pleasure it was to the Romford Company that they should have found time to be present on that occasion to open their new premises. As a Company, they felt that they had a personal interest in the town of Romford. About ninety years ago certain Romford gentlemen formed this Company, which has been supplying the district with gas ever since. Romford had grown and prospered since then, and the Company had shared in that progress and had always been able to keep pace with the growing demand for its products. The Company was one of Romford's largest ratepayers and was also a large employer of local labour, the wages for which were spent locally for the benefit of the town. The Company were fully alive to the needs of 1938, and were closely concerned with giving the people of the town the most modern facilities for the use of gas. The Chairman then invited the Mayor to declare the new building open.

His Worship the MAYOR remarked that this was one of his duties which he regarded as a particular pleasure. His Council had for a great many years a lot to do with the Gas Company, and he had no doubt they would wish to continue to do so. The new building was very much up to date, and as a Council they welcomed such buildings as this in one of their most important shopping areas; he wished there were more buildings of the kind, and the Council wished to encourage them. They were taking what steps they could to control the appearance of the buildings likely to be put up during the next few years. While that was not always an easy thing to do, they were able to control the buildings to-day to a greater extent than was possible a few years ago—and he emphasized how much he appreciated this particular type of building. It would stand out as an example of what 1938 could do and as an example of the best type of architecture.

Alderman Allen also referred to the activities which were to be carried on in the new building, stressing particularly the value of the cookery demonstrations which were to be held with a view to assisting the housewives of the town. There was, he said, a great deal to be learnt from up-to-date cooking methods, which would lead not only to greater happiness, but greater health in the home. In conclusion, he complimented and congratulated the

An Imposing View of the Showroom The Cashier's Counter can be seen in the left hand corner.

Romford Gas Company not only on their beautiful new building, but also on the activities they were going to conduct therein.

The Mayor thereafter proceeded to the main doors of the showroom, which he unlocked and opened for the first time to the public, following which Mrs. BEVOUS J. SMITH unveiled a bronze plaque in the showroom commemorating the occasion. Charming bouquets were then presented to the Mayoress and Mrs. Smith by Miss Joan Graystone (daughter of the Company's Engineer), who was presented, in turn, with a beautiful doll by the Chairman.

Proposing a vote of thanks to the Mayor, Mr. EDWARD WILSHAW (the Deputy-Chairman) said he wondered if there was any country in the world that could compare with England for the high percentage of the populace who devoted their time freely and disinterestedly to public service. They had only to recall such activities as the Special Police, the Bench, the Territorials, the Welfare Worker, the A.R.P., Poor Law Administration, Education, and, last but not least, Administration of Public Affairs. It might well be that this voluntary public service was the secret of the country's greatness and the liberty of her people. Alderman Allen, if he might say so, exemplified this; for he had over a long period of years given of his best in the public interest—which had culminated in his selection as Charter Mayor. They were therefore doubly happy that he had come there that day to open the new showrooms of the Company.

In designing the new building, continued Mr. Wilshaw, they had all had in mind the preservation of the good name of Romford—that ancient and delightful market town—and he had a dream that some day South Street might be a continuation of that dignified building throughout its length, for this was the first impression the public travelling by rail had of the town. Designed by a Romford architect and built by Romford builders, they felt that they had made a contribution towards the dignity of the town.

As to the Company itself, it was a child of Romford. It was created by two or three Romford men; many of its Directors had always been Romford men. It employed a large number of staff and workmen, all recruited from Romford and living in the district. It had advanced with the times and had never let Romford down; it was able to sell gas at the same price as that great and ably managed undertaking, the Gas Light and Coke Company. Its motto was to serve. It had the goodwill of the public and the respective Councils, and they hoped that those good relations would be fostered and maintained for the benefit of the district for generations to come.

Having once again thanked the Mayor and all those who had come there to honour the Romford Company with their presence on that occasion, Mr. Wilshaw handed Alderman Allen a beautiful

The Demonstration Theatre.

inscribed silver cigar box as a token of their appreciation and an expression of their goodwill.

The MAYOR accepted the presentation on behalf of the Borough, thanking Mr. Wilshaw and the Company very warmly for the gift. He thanked the Company not only for giving him the opportunity of accepting it on behalf of the Borough, but also for adding their contribution to the amenities of the town in the shape of the new building during its first year as an independent Borough.

Those present then inspected the new premises, and were subsequently entertained at tea at the kind invitation of the Chairman and Directors of the Company.

Glasgow Gas Department Silver Band

Many of our readers will have heard of the successes of the Glasgow Gas Department Silver Band, which has come out top in nine successive musical festivals, and after coming in second in one event has now regained its premier position.

These successes include a Scottish Band Association Sectional Championship, Strathaven, Douglas, Lesmahagow, Hamilton, and both the Glasgow and Edinburgh Charities Association Championships—contests open to all bands in Scotland. Its latest success was earned on May 7 of this year, when the £200 Beardmore Shield—the tangible award which goes with the Glasgow Charities Championship—was won by a record total of 96% of possible marks, 12 more than its nearest rival.

Much of the credit of the band's outstanding brilliance goes to its President, Mr. John W. McLusky, the Engineer and General

The Band with some of their Trophies.

Manager of the Glasgow Corporation Gas Department, who is himself an accomplished musician, and to the indefatigable service of its Chairman, Bailie Alex. Munro, who attends every meeting, and keeps a watchful eye on the rehearsals.

The band's rise to fame has not been meteoric. Instituted shortly after the war, and equipped with a full set of Besson silver-plated instruments, the men were content to plod along, competing at local contests, but not with much success. Somewhere about eight years ago Mr. Herbert Bennett was appointed Bandmaster. Carrying out his theory that the "win fame quick" policy at the expense of other bands is neither good for the Brass Band movement nor conducive to domestic harmony, "star" players were not brought in. The men were given a comprehensive course of musical theory, and a firm grounding in the art of good tone production. That the men appreciated this gruelling course from the kindergarten to the highest standard is proved by the fact that during the last six years only one man has left to join another band—a crack band in the Midlands. Old age, reckoned by failing eyesight and disappearing molars has compelled three or four of the original members to retire, but—and this must be stressed—not one member has been dismissed for inefficiency or insubordination.

There is a happy spirit of camaraderie among the players; they are not bound by commandments; they are all on their honour to attend every rehearsal. If a man is absent, he is out looking for a leak or fixing up somebody's cooker. Discipline is a matter of course, and no one has yet been under castigation.

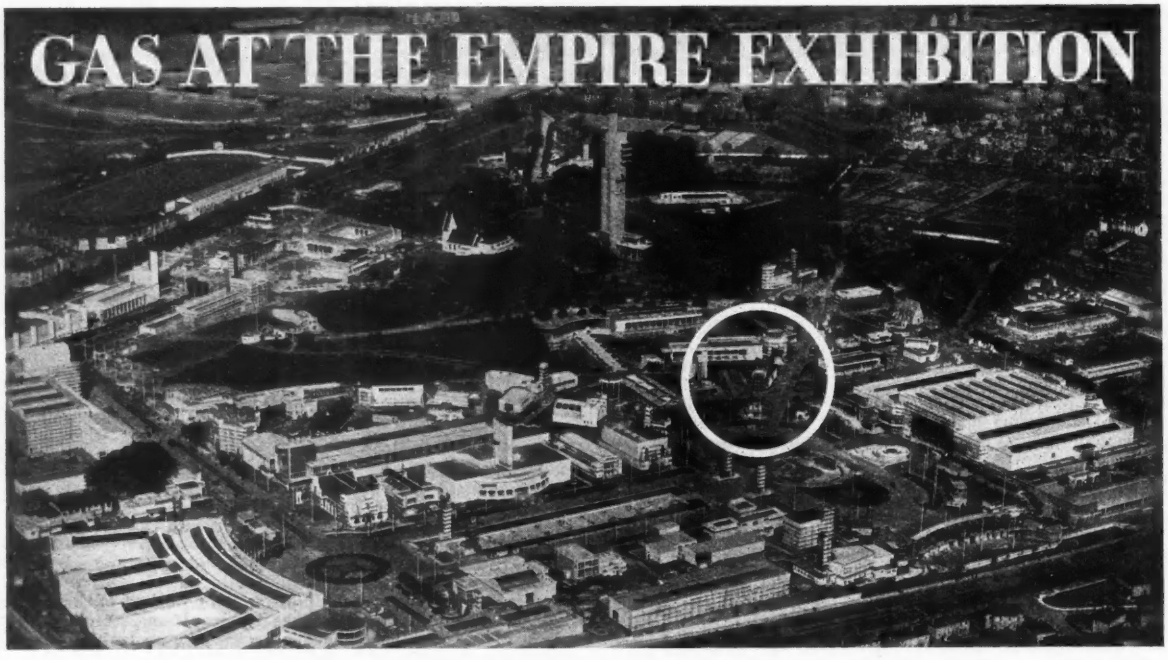
"Contesting" is not taken too seriously—that is to say, the band is kept at standard pitch all the year round. The men realize that it is as important to give as perfect a performance at every engagement as it is vital at a Contest.

The band is very popular in Scotland, and the principal cities and towns are visited during the summer season. Even the Gaels in far-away Tobermory speak of it as "our band." It was a signal honour to be first brass band to be offered a week's engagement at the Empire Exhibition. Two visitors from America were so impressed with the performances that it is more than likely that an offer will be received to play at the next New York Exhibition.

It seems almost superfluous to say that the name of the band appears regularly in Broadcast programmes.

It would be unfitting if a generous meed of praise were not given to the band's popular Bandmaster. Mr. Bennett is known throughout the British Isles as one of its most efficient adjudicators. He has proved for over a quarter of a century, through his many bands, that he is equally talented as a Conductor. As the Band Editor of the Associated Scottish Newspapers, Ltd. he has done probably more than any other man to raise the prestige of brass bands in the eyes of the public.

GAS AT THE EMPIRE EXHIBITION



An aerial view of Bellahouston Park, Glasgow, showing (ringed) the Gas Pavilion.

The Gas Industry visit, organized by the British Gas Federation, to the Empire Exhibition took place on June 22 and 23. Large numbers of representatives from all parts assembled at 11 a.m. to hear Papers contributed by Mr. John Keillor, of Vancouver, and Sir David Milne-Watson to the proceedings of the International Engineering Congress, and subsequently lunched together with Sir David, as President of the Federation, in the chair. The remainder of the two days were devoted to an inspection of many fine exhibits.

INTERNATIONAL ENGINEERING CONFERENCE.

At the International Engineering Congress at the Empire Exhibition, Glasgow, on June 22, a Paper on "Recent Developments of the Gas Industry in Canada" was submitted by Mr. John Keillor, Vancouver, which was followed by another by Sir David Milne-Watson on "The Gas Industry—Past, Present, and Future." The first Paper was read in Mr. Keillor's absence by his nephew, Mr. R. D. Keillor, Engineer and Manager of Greenock Corporation Gas Department.

Mr. R. Robertson, President of The Institution of Gas Engineers, who presided, said the business of the engineer was to utilize all sources of power for the benefit of mankind, and it was therefore appropriate that engineering activities should be a prominent part of the Exhibition, with the objects of which the Gas Industry was in complete accord. Ample proof of this was found in the various gas exhibits. The Industry was making important contributions to the solution of such national problems as coal carbonization, smoke abatement, industrial development, and last, but not least, domesticity without drudgery and tears.

After a vote of thanks to Mr. Keillor, who, it was announced, had a mass of information for those who desired it, Sir David Milne-Watson read his Paper on "The Gas Industry—Past, Present, and Future," following which the Chairman said that Sir David had carefully drawn a picture of the past, present, and future of the Industry with a master's hand and in proper perspective. The key to the situation was in the capacity of the Industry to adapt itself to the needs of the day. It was up to them to take advantage of his wise words and put their house in order.

Sir David's Paper will be found on other pages of this week's "JOURNAL," while that of Mr. Keillor will be dealt with in an early issue.

Luncheon.

On the invitation of the British Gas Federation, delegates were entertained at luncheon in the Concert Hall Restaurant in the Exhibition, Sir David Milne-Watson, Bart., LL.D., D.L., Chairman of the Council, presiding, and being accompanied, among others, by Lord George Nigel Douglas-Hamilton the Commissioner for Special Areas for Scotland: Lord Weir of Eastwood; Sir Cecil M. Weir, M.C., Chairman of the Administrative Committee of the Exhibition; Sir William E. Whyte; Sir Alexander B. Swan; Sir Russell Bencraft; and many representatives of various municipalities and undertakings.

After the loyal toast had been honoured, Sir Cecil M. WEIR, M.C., proposed the toast of the British Gas Industry, extending a welcome to all members of the Industry on behalf of the Administrative Committee of the Exhibition. Nothing could advance the purposes of the promoters as much as the series of conferences they were having, 72 of which had already been arranged. Gas had played its part well in the Empire Exhibition. In the Palace of Engineering they could see many industrial uses of gas while the Gas Pavilion featured the domestic uses of gas. "Mr. Therm" had a great deal to show to the general public of which the general public was not aware. He did not propose to make comparisons between gas and other forms of fuel. That would be an indiscreet proceeding for the Chairman of the Exhibition. But he desired to say that their Industry was extraordinarily progressive and had held its own in face of keen competition. He was satisfied that in the future it would still go ahead. He coupled the toast with the name of Sir David Milne-Watson.

Replying, Sir DAVID MILNE-WATSON said he was proud of the Gas Industry and proud that their Conference was being held that day in Glasgow. The Exhibition had achieved a wonderful success. It had been completed in time and it had a beautiful natural setting. In every way it was most instructve and attractive. It showed what services gas could provide for the country and the city. They in the Gas Industry had done their part in seconding the efforts of the Exhibition authorities to enlighten the people. It was the Gas Industry that revolutionized industrial life. It was the first to fight the powers of darkness and it had abolished night. Before it came into existence 130 years ago night closed down all the activities of men. Now it enabled men to work or to play after the sun had set. They were now out to conquer smoke, another great enemy of their industrial life, something that produced darkness, turned day into night, and made unnecessary work. It was also responsible for disease. He was sure that a progressive city like Glasgow would help them in their task of combating this enemy.

Councillor WALTER MUTER, J.P., Edinburgh, proposed the toast of "The Guests."

Replying, Lord NIGEL DOUGLAS-HAMILTON said that in Scotland they were still greatly dependent on gas for the industrial products which they made. There were times when they had been in

clover, so to speak, so far as their coal, iron, and markets were concerned, but these days were over. No part of the land was more suited, or more needful, for the regional planning of industry than the West of Scotland. They had first-class craftsmen and leaders of character but they had not the willingness to co-operate. In the Exhibition they had a magnificent example of co-operation. The resources of Scotland were harnessed together there as never before. If they were to hold their own in the fierce economic struggle that existed they had to harness their resources together and there was no more desirable subject for co-operation than gas. They would always meet the coincidence of supply and demand, and it was for them to satisfy both the supplier and the consumer.

Sir ALEXANDER B. SWAN, ex-Lord Provost of Glasgow, proposed a vote of thanks to the Chairman.

A REVIEW OF THE GAS EXHIBITS.

Presiding at the Gas Industry Session of the International Engineering Congress, Mr. R. Robertson, President of The Institution of Gas Engineers, said that the engineer's task was to utilize every form of natural energy and every source of power for the convenience and comfort of mankind. It was therefore appropriate, he declared, that gas should take its place in the Exhibition and should prove, by its various exhibits, what it was doing towards solving problems like smoke abatement, and the bringing into force of domesticity without tears and drudgery.

A survey of the gas exhibits in the Exhibition amply confirms the statements made by the President of the Institution. In the Palace of Engineering there has been assembled a notable array of gas equipment for industrial purposes, while elsewhere beneath the same roof certain private firms have their own displays. In the Gas Pavilion, a few yards away, are to be seen domestic gas appliances, which have so enormously lightened the housewife's labour. Further illustration of this is found in the planned kitchen of the Women's Gas Council in the Women of Empire Pavilion. The whole process of coal carbonization, with the valuable by-products which accrue, is demonstrated in the United Kingdom Pavilion by a striking display. Elsewhere, in the City of Glasgow Pavilion, Glasgow Corporation Gas Department brings home to its consumers the many services it offers.

It is not too much to say that the Exhibition owes much of its success to gas. Within the grounds of Bellahouston Park there exists at present a town with an average population of some 60,000. There are sixteen restaurants and numerous smaller tea-rooms, milk bars, and cafés, all using gas. Many of the stands, especially those manufacturing their products on the spot, are dependent on gas. In the Palace of Art, which is to be retained by Glasgow as a permanent building, a gas-fired central heating plant has been installed. In the Palace of Industry Montgomerie's Bread Company, Ltd., of Glasgow, have installed a Pelkmans swing tray oven, producing 800 2-lb. loaves each hour and running continuously, the bread being sold on the spot and any surplus being taken to the firm's Glasgow bakery. The oven is gas-fired and has an hourly consumption of 6,000 cu.ft. Gas has proved a most efficient heating medium, a working temperature of 400° F. being obtained in one hour and the control of the heat throughout the process being perfect. In the Empire Tea Pavilion, where an enormous amount of tea has been consumed, gas is used.

"The Gas Industry," said Sir David Milne-Watson last week, "has ably seconded the efforts of the promoters of the Exhibition to enlighten the people." No visitor to the Exhibition can leave it without feeling that the Industry has thoroughly justified its claim to be a great servant of the public.

PALACE OF ENGINEERING.

B.G.F. Exhibit.

The industrial gas exhibits in the Palace of Engineering have proved one of the most popular sections in the Exhibition, thousands of visitors having inspected the various products on view. An extraordinarily large number of enquiries have been received by the staff, these coming from all parts of the world.

Mr. D. LAWSON,
Organizer of the Gas Industry's Exhibits.

Numerous firms engaged in the manufacture of industrial gas apparatus have co-operated to make the display thoroughly impressive and informative, while an abundance of literature is available for the information and instruction of those interested.

A. H. Wilkes & Co., 38a, Paradise Street, Birmingham, are showing a patent double deck type furnace for hot pressings and rivet heating. The furnace is constructed of strong steel plates and angles and is heavily lined with special heat-resisting metal lining, made in sections for easy replacement and backed by insulating bricks. It is fitted with the patent Wilkes Vesuvius single cock control air-gas mixer and a cheaper type quadrant cock control air-gas mixer is also available. Low-pressure town gas is supplied at 3-in. W.G. and air between 1 and 2 lb. pressure per sq.in. to the new type adjustable burner head.

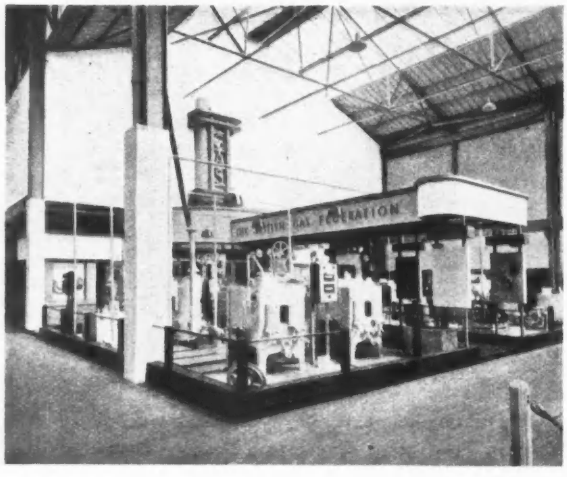
Amal, Ltd., Perry Barr, Birmingham, are showing industrial gas injectors, giving a true ejection into a concentric air choke. The jets are numbered from 20 to 5,000 Amal and enable the

The Carbonization of Coal Exhibit.

amount of gas passed to be stated when the pressure and specific gravity are known.

Bratt Colbran, Ltd., 10, Mortimer Street, London, W. 1, have on view overhead radiant heaters for use in public halls and churches, where intermittent heating is required. They can also be employed for continuous heating as they have a high overall efficiency. The gas rate is 25 cu.ft. hourly on 500 B.Th.U. gas and radiant heat output totals about 5,500 B.Th.U. per hour.

Brayshaw Furnaces and Tools, Ltd., Belle Vue Works, Manchester, are showing a "Maxoven" gas heated furnace for general utility purposes. The furnace is well insulated to reduce heat losses and its gas consumption for maintenance is low. All burners and combustion passages are accessible while the furnace is at work and the furnace floor, built of standard brickwork strongly supported, will carry heavy weights and can be easily repaired by the user. With standard insulation a temperature of 1,050° C. can easily be reached and special insulation is provided for higher temperatures.



A View of the B.G.F. Industrial Exhibit in the Palace of Engineering.

Briggs Boilers, Ltd., Sugar House Lane, Stratford, London, E., are showing the "City" gas-fired steam boiler, recommended for use in connexion with milk sterilization, Vienna bread baking, moulding synthetic resins, and other industrial purposes. Quick steaming and high efficiency are claimed for this boiler.

Chance Brothers & Co., Ltd., Smethwick, have on view a range of Bornkessel type burners. There is an all-metal jet, obviating breakage and rendering adjustment for alignment unnecessary. No individual jet adjustment is needed, gas and air control taps governing all jets from one point. The burners are highly suitable for glass tube bending and any process which demands an even temperature over a definite area.

Cochran & Co. (Annan), Ltd., are showing their Cochran accessible gas-fired boiler, a duplex installation being in view. Both boilers are connected to a single control column and there is complete accessibility for cleaning and inspection, thereby ensuring permanent efficiency.

Hancock & Co. (Engineers), Ltd., Croydon, are showing a direct cutting and profiling machine which uses oxy-coal-gas, a Universal electric tracer being fitted with a single roller operating semi-automatically from a wooden template. The machine has both fixed and movable centres and circles of any radius from 1¼ in. upwards can be cut automatically.

Ideal Boilers and Radiators, Ltd., have on view an Ideal gas boiler for hot water supplies for a household and an Ideal gas boiler for central heating and indirect hot water supply. The boiler thermostat automatically controls the supply of gas to the burners as the water reaches or falls below the temperature to which the thermostat is set, while a clockwork device reduces the gas supply to the boiler to the minimum required. The domestic boilers are compact, taking up little space, and their vitreous enamelled finish gives them an attractive appearance. There are large clean-out openings which in hard water districts facilitate the removal of lime deposits.

Imperial Chemical Industries, Ltd., London, have a Cassel salt bath furnace on view. The gas and air cocks are standard cast-iron gas cocks not coupled in any way. The Popular model heats up to 950° C. in 1¼-1¾ hours and by its use it is possible to calculate the total time necessary to carburize a known weight to a given depth.

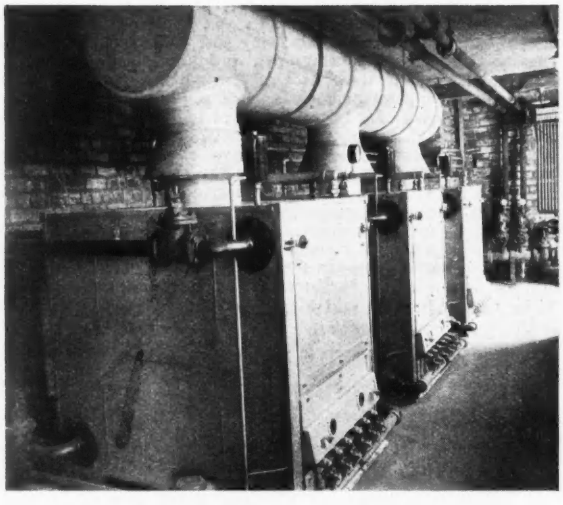
The Incandescent Heat Company, Ltd., Smethwick, have on view two furnaces, one being a deep recuperative furnace fired by town gas suitable for heat operations up to 1,200° C. A patent incandescent multi-combustion chamber system ensures excellent combustion and high thermal results. A high speed steel furnace is also shown. It has upper and lower chambers, one for preheating and the other for hardening. It represents the latest development in furnace engineering practice and gives a combination of rapid heating and low operation and maintenance costs with single and simple control.

Liptak Furnace Arches, Ltd., Victoria Street, S.W., are showing Gako burners, for all services requiring over 300 cu.ft. hourly. A low-pressure burner is designed so that the air and gas pass through it in alternate thin layers, spiral guides and passages giving a whirling motion. The Gako burners can be combined in one unit with automatic temperature control apparatus and have the special advantage that the gas can be controlled down to zero without fear of a blowback.

Perfecta Gas Thermostats, Ltd., 55-56, High Holborn, London, are showing a Perfecta gas-fired air heater for domestic heating and industrial purposes. A draught diverter is also supplied with the heater. Heat exchange surfaces are welded together to have one air duct alternating with a combustion channel. The heater is fitted with a flame failure device to prevent damage to the heating element through overheating in the event of the air supply being cut off. A baffler is also supplied with the heater.

Thomas Potterton (Heating Engineers), Ltd., Cavendish Works, Balham, are displaying a "Rex" gas-fired heater suitable for central heating. The fittings include a thermostat with regulator for varying water temperature, flue baffle, and gas pressure governor. The front plate can be readily removed, exposing the interior for cleaning purposes.

Selas Gas and Engineering Company, Ltd., City Road, Manchester, are showing G.L.C. new type patent muffle soldering stoves, manufactured and distributed under licence granted by the Gas Light and Coke Company, natural draught gas burner injectors, and a controlled radiant flame burner with automatic air shutters. The muffle soldering stoves have been specially introduced to facilitate and improve the process of soldering by ensuring the provision of clean bits at the correct temperature. The heating chambers are made from heat-resisting and non-scaling steel, constant temperatures being maintained and overheating avoided.



Gas Central Heating Plant in the Palace of Arts.

Serck Radiators, Ltd., Warwick Road, Birmingham, show a Serckulator, gas unit heater, and quenching tank. The maximum gas consumption of the Serckulator is 300 cu.ft. per hour and it recirculates hot air at speed by a propeller fan over heated tube surfaces. A thermostatic control is fitted and there is excellent insulation.

The South Metropolitan Gas Company are showing a Metro muffle furnace enclosed in a circular aluminium case and heated by luminous burners, radiation losses being reduced to a minimum by the use of special insulating materials. A temperature of 1,100° C. can be reached in less than an hour with a gas consumption of under 0·3 therm and this temperature can be maintained with an hourly consumption of roughly 0·2 therm.

Ruston & Hornby, Ltd., Lincoln, have on view a G.B.T. horizontal type gas engine suitable for driving individual machines or

line shafting and also for use for driving dynamos by belt for such purposes as charging accumulators. A small thumb screw controls the governor and allows the engine to work at a wide range of speeds. Working parts are totally enclosed but are easily accessible for inspection and adjustment.

The Sheffield Gas Company are showing two high-speed steel heat-treatment furnaces controlled in atmosphere and temperature for precision hardening. The process prevents surface damage to steels during their treatment. One of the furnaces is used for temperatures up to 850° C. for pre-heating purposes and also supplies the purging gases for atmosphere control for both furnaces. This furnace can also be used as a separate unit for steels only requiring temperatures up to about 1,000° C. The second furnace is for high-temperature purposes with a working temperature up to 1,400° C.

Keith Blackman, Ltd., Farringdon Avenue, London, have on view Keith patent burners and injectors for industrial heating. The firm are also showing a gas-fired unit heater, consisting of a battery of vertical tubes of Staybrite steel underneath which is a combustion chamber formed of gilled cast-iron plates. The air flow operates an automatic gas valve, so that the simple switching on of a fan starts up the heater. The unit is valuable for workshops where floor space is scarce.

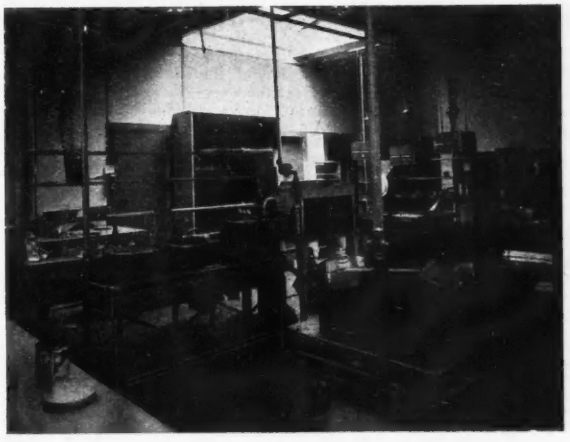
Town Gas Boilers (Bonecourt), Ltd., 82, Victoria Street, London, are showing a Bonecourt gas-fired steam boiler. It can be supplied in seven sizes with evaporations up to 240 lb. per hour and is highly serviceable for valet service cleaners, small dairies, confectioners, and clothing and hat manufacturers. The "B" type Bonecourt boiler is made with evaporations up to 4,000 lb. per hour and is suitable for larger factories.

George Kent, Ltd., Luton, are showing their "Multelec" temperature recorder-controller. The mechanism provides for rapid operation of the controlling contacts, simplicity and accessibility of the parts, and easy and accurate setting of the control zone and point.

The Bristol's Instrument Company, Ltd., North Circular Road, London, N.W., have a Bristol ampliset free vane controller on exhibit.

The Morgan Crucible Company have a gas-fired crucible tilting furnace on view, suitable for melting non-ferrous metals. The metal charge is not in contact with the flame during the melting process, thus ensuring purity and reducing loss.

Lucas Furnaces, Ltd., Birmingham, are showing a gas-fired natural draught furnace constructed on the under-fired principle. The recuperative chambers are of metal and the insulation prevents heat flowing through the furnace walls. An automatic temperature controller is fitted.



The Gas Kitchen serving one of the Exhibition Restaurants. The Gas Consumption in this Kitchen is as much as 3,000 cu.ft. per hour.

The Horstmann Gear Company, Ltd., Newbridge Works, Bath, are displaying a main tap controller, pressure governor, and G.L.C. pressure safety cut-off valve.

Electroflo Meters Company, Ltd., Park Royal, London, are showing automatic temperature and atmosphere control equipment.

Elliot Brothers (London), Ltd., are also showing automatic temperature control regulators, temperature variations being shown by green and red lights in the panel which carries the regulator.

The Cambridge Instrument Company, Ltd., have on view a direct deflectional regulator, a moving scale indicator, a Cambridge Index thermometer, a draught gauge, and a disappearing filament pyrometer, with a rheostatic motorized valve and a Cambridge "B" recorder.

The Brockhouse Heater Company, Ltd., Willesden, are showing gas-fired steam boilers.

Constructional Engineering Company, Ltd., Birmingham, are exhibiting standard gas-fired boilers, No. 3 being on view, 3 ft. 6 in. by 1 ft. 6 in. diameter, with evaporation capacity up to 70 lb. per hour and built for a working pressure of 100 lb.

Ascot Gas Water Heaters, Ltd.

The site obtained for the stand of the Ascot Gas Water Heaters, Ltd., in the Palace of Engineering, was not an easy one to use from the point of view of the designer owing to two large steel stanchions of the main building structure rising from the centre of each side. A further problem arose from the regulations not permitting side walls to be higher than 6 ft. 3 in., which is an inadequate height for the fixing of the larger models of "Ascot" gas water heaters.

The Ascot Stand.

To overcome these obstacles it was decided to encase the steel stanchions and cross girder in standard exhibition treatment, using the girder as an extra fascia, also to have a complete working display of the various "Ascot" models at the back of the stand where the height permitted.

The front of the stand is laid out on a slightly raised terrace as a tea bar to demonstrate "Ascot" boiling water appliances. Comfortably upholstered shaped seats are built round this portion, the seating being also designed for the display of literature. Small stools make ideal tables for the tea cups and small plates. One side wall of this front portion is used for the display of the smaller "Ascot" heaters. In order to create an impression of increased size, mirror glass is used for one wall of the tea terrace and heater display. Included in this mirror is an attractive electrically operated clock having chromium-plated taps for numerals and illustrating the Ascot slogan—"Hot water—any time—any tap."

Facing visitors on the tea terrace is an interesting working model built into the stand, which shows the "Ascot" multi-point heater installed in a house as an alternative to a coke-fired boiler and the turn of a switch indicates the circulation system which applies with either in use.

The large working display section at the back of the stand has a wall of 6 in. by 6 in. blue tiles, panelled bath, pedestal basin, and stainless steel sink unit, the latter being used as a bar for the service of tea. Appliances shown in operation in this section include a multi-point heater which automatically serves the whole house with instant hot water to bath, basin, and sink; a bath water heater in totally enclosed enamel and chromium casing; a boiling water appliance giving water in 40 seconds, also hot or warm water by the turn of a temperature control. The popular sink water heater for immediate continuous hot water for washing-up and other household needs and an "Ascot" storage heater, so indispensable to hairdressers, are also shown for practical demonstration.

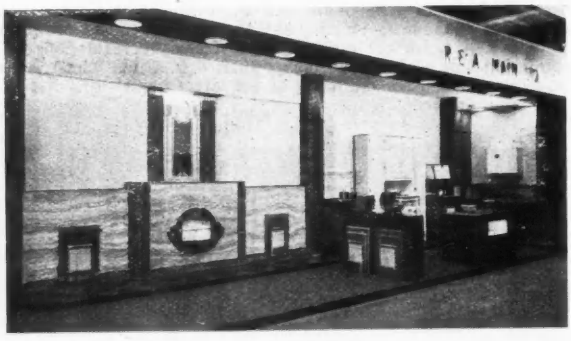
A small office and store has been cleverly constructed in the space behind the main steel stanchions.

Pin-on metal letters in lieu of the usual sign-writing add smartness to what can often be a disfiguring element in exhibition stands. The floor of the stand has cork tiling on the tea terrace with linoleum for the remainder. Taken as a whole, the designers are to be congratulated on making so effective a presentation in such apparently awkward circumstances. The inviting appearance of the front of the stand and the tea bar is a novel way of inducing visitors to come on to the stand for a demonstration of the "Ascot" appliances installed at the back in a manner no less interesting.

R. & A. Main, Ltd.

The display of R. & A. Main in the Palace of Engineering comprises a comprehensive range of gas appliances. Decoration on the 75 ft. long stand is not without interest, giving as it does the impression of golden warmth, due partly to the indirect amber glass lighting. The various sections of the stand—cookers, fires, water heaters, &c.—are separated by semi-circular pilasters in wax-finished walnut.

Among the appliances on view, the "Sussex" series of cookers occupies a prominent place. One of these is shown with the "P.R." hotcloset attached above the cooker. The cookers are finished in deluxe and grey dapple enamelling and are fitted with



R. & A. Main's Display.

automatic lighters. The central feature of the gas fire section includes two of the new models belonging to the "Fire-King" series. These incorporate a self-lighter, and are suitable for any modern interior, being available in a wide selection of colour finishes and five different designs. A "Gloria" panel fire occupies the middle position of this display, the walls of which consist of cedar and golden onyx. Gas water heaters of many types are on view, from the "Prestot" and the "Pronto" instantaneous sink heaters to the "New Lido" geyser and the No. 14 "Thermain" multi-point storage heater, the last-mentioned being connected up to a stainless steel sink.

Lastly, reference must be made to the large cooking apparatus which has aroused considerable interest among the hotel and boarding house proprietors who have visited the stand.

M. & C. Conveyors.

Since an exhibition stand cannot conveniently contain hundreds of feet of working conveyor, Mavor & Coulson, Ltd., are reducing their exhibition conveyors to the scale of 1 in. to the foot, which allows them to show the equivalent of nearly 500 ft. of belt conveyor and no fewer than eight associated appliances. The whole forms one installation, complete in every detail, and explains the methods most often used by M. & C. for handling bulk materials. The advantages of M. & C. Sectional Belt Conveyors are clearly seen, notably the ease with which they can be built into structures and bridges and the way in which they save width and weight in gantries. Other points of interest are an M. & C. extending end which enables a conveyor to build and extend a tip-heap; a fixed tripper loading a lorry; a travelling tripper moving backwards and forwards above a series of bunkers to which it distributes material evenly; rotary screen; bucket elevator; bunker and "F.P." hopper door, besides various types of drives, driving gears, tension ends, and chutes. The model occupies 74 sq.ft., and provides an education in belt conveyors. Four sizes of M. & C. grit-proof idler rollers represent the long range of sizes available for belts from 12 in. to 60 in. wide. Two of the rollers are sectioned to show the grease seals which keep all grit, dust, and water out of the ball bearings and enable the rollers to continue to run with low friction even under bad conditions out of doors in rain and mud.

THE GLASGOW GAS DEPARTMENT.

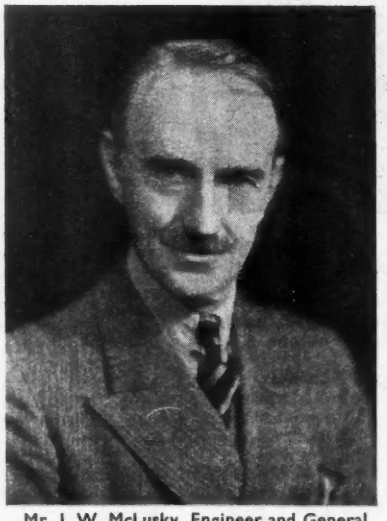
It was in the year 1805 that gas was first used as a method of lighting a Glasgow shop, and two years later the same illuminant was employed in a weaving shed in Pollokshaws. In 1817 Parliament granted statutory powers to the Glasgow Gas Light Company to produce "inflammable air" and other products from coal, the first public street lamp being lit by gas in the following year. By 1827 the total output was 80,000,000 cu.ft., which had increased in 1843 to 217,000,000 cu.ft. In the latter year a second company, the City and Suburban Gas Company, of Glasgow, was incorporated by Act of Parliament, with power to supply the city and what were then adjacent villages. The rival concerns continued in competition till 1869, when they were both transferred to the Corporation, shareholders being indemnified and the Act sanctioning the transfer stipulating that the Corporation should not charge more than 4s. 7d. per 1,000 cu.ft. In 1871 the Partick, Hillhead, and Maryhill Gas Company was formed without Parliamentary powers, the Company building works at Temple and purchasing the Old Kilpatrick Works in 1890. The following year the Corporation bought up this concern and in subsequent years also took over gas undertakings at Pollokshaws, Milngavie, Thornliebank, Baillieston, and Newton Mearns.

Development from Early Days.

It was in 1817 that work was begun on the first city gas-works at Townhead, the gasholder, of 25,000 cu.ft. capacity, then being the largest in the Kingdom. Provan Gas-Works was originally designed in four sections, one of which was completed in 1904. In 1919 construction began of a complete installation of carbonizing and purification plant on a new site, the plant being designed to carbonize 1,356 tons of coal daily and produce 18 million cu.ft. per day. Each section, complete in itself, has two benches of 24 retorts each and in the event of the auxiliary plant of one section failing, a travelling cross-conveyer allows of service from another section. The 192 retorts each yield from 88,000 to 100,000 cu.ft. daily, the amount varying according to the quality of coals and thermal value of the gas.

The works at Temple are now used for storage and distribution, two three-lift gasholders being there, with a boosting plant deal-

Councillor Thomas Wilson, Convener, Glasgow Gas Committee.



Mr. J. W. McLusky, Engineer and General Manager, Glasgow Gas Department.

Mr. Alex. Bujnowski, Sales and Publicity Officer, Glasgow Gas Department.

ing with 800,000 cu.ft. hourly. In 1871 began the construction of the Dawsholm Works, connected by a 284 ft. tunnel with Temple, two 36-in. mains joining the two works. There the carbonizing plant was reconstructed in 1927. Tradeston Works have been extended from time to time, and to-day have a daily output of about 5,000,000 cu.ft., while Dalmarnock Works, originally constructed by the old City and Suburban Gas Company, have been modernized from time to time and to-day are absolutely up-to-date.

In addition to the gas manufactured in the Gas Department's own works, the city, until recently, took coke oven gas to the extent of 2,000,000 cu.ft. daily from the Auchengeich plant of Messrs. James Nimmo & Co., Ltd. That contract has now expired and negotiations are still being carried on regarding a supply of coke oven gas being taken from a nearer source.

Apart from its own needs, Glasgow supplies street and stair lighting for 19 other lighting authorities in the district, supplying a total of over 90,000 street lamps and stair jets. The last available figures show that in this connexion 577,315,186 cu.ft. of gas was consumed for the year, the revenue from this source being £40,551. The Department has 172,722 ordinary meters and 163,998 prepayment meters, a total of 336,720, and the last output figures show a total of 10,073,310,000 cu.ft. for twelve months.

Supplies to the Exhibition.

The Department has, during the last year, successfully coped with the huge task of equipping the Empire Exhibition in Bellahouston Park with gas. Over 12,000 ft. of services were laid and 88 meters installed, these varying from 40 to 6,000 cu.ft. per hour. The Palace of Art consumes this last-named amount for its heating installation, while 11,010 cu.ft. is consumed each hour in the Palace of Engineering, the largest building in the Exhibition. Some 6,000 cu.ft. are used hourly on the British Gas Federation's stand, while Ascot Gas Water Heaters, Ltd., take 1,200 cu.ft. hourly. In the Palace of Industry, with its hourly consumption of 14,000 cu.ft., Montgomerie's Bread Company, Ltd., is responsible for 6,000 cu.ft.—the amount used each hour by the Pelkman Swing Tray Oven which they have installed and which is in continuous operation. The restaurants are large gas consumers, seven of these taking over 3,000 cu.ft. per hour, with others using smaller amounts. From the opening of the Exhibition to May 31, a period of about four weeks, the consumption was 7,071,700 cu.ft., and the total consumption before the end of October should exceed 50,000,000 cu.ft.

Glasgow Gas Department Stand.

The Gas Department Exhibit of Glasgow Corporation in the City of Glasgow Pavilion has been arranged to serve two purposes, first, to illustrate the work of the Department and, secondly, to afford to Glasgow consumers facilities for purchase or hire of appliances.

The east wall of the stand illustrates the derivatives from coal as obtained by the Department. On the west wall is a section of a vertical retort, while in the centre of the stand is displayed a model of a complete retort bench.

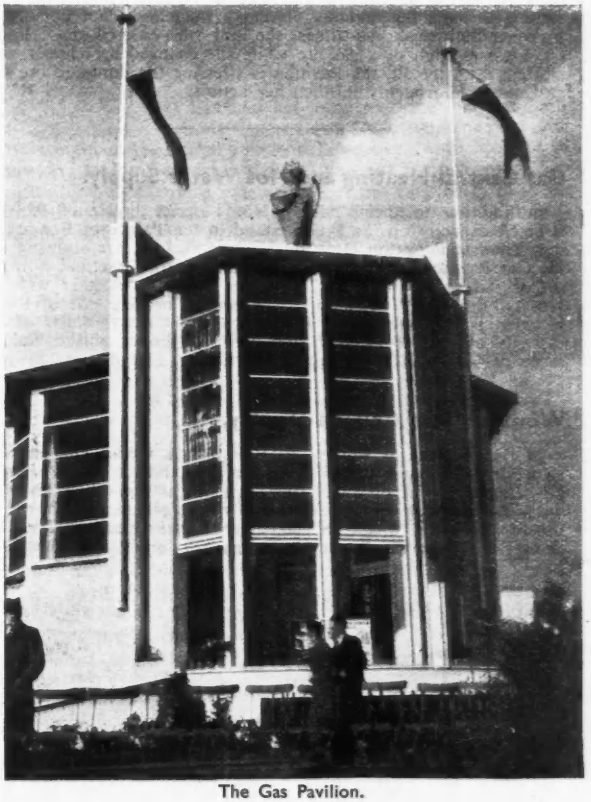
The Gas Department's Display in the City of Glasgow Pavilion

On the stand, prominently displayed, is a cascade in Exhibition style showing an arrangement of water heaters. Gas fires, gas cookers, gas refrigerators, and gas water heaters are all on show, with a glass gas meter built in the Department's workshops. Other small apparatus are also displayed to effect. Two rays of light blend effectively with the colour scheme of the Stand, and considerably enhance its appearance.

Since the opening of the stand exceptionally good business has been done, and the exhibits are proving a source of great interest both to Glasgow consumers and to visitors from other parts.

THE GAS PAVILION.

Up to the date of the Congress last week no fewer than 75,000 persons had passed through the Gas Pavilion. The indications are that the average number of visitors will grow steadily. Already a considerable number of municipalities and public authorities have inspected the Pavilion and its contents. More delegations have intimated their intention of visiting it within the next few weeks. From places as far distant as Palestine and Lithuania have come enquiries regarding apparatus shown in the Pavilion.



The Gas Pavilion.

The Pavilion, situated north of the Palace of Engineering, is an imposing building, built of steel and glass, with a Gemosign above containing the letters G A S in 3 ft. size. Within are to be found practical illustrations of how domestic labour can be substantially reduced by the use of gas appliances. Gas ovens, gas refrigerators, central heating sets, which can be used in quite small houses, water heaters, and gas fires are all on show.

Since the Pavilion was opened in the first week of May certain changes have taken place. "Mr. Therm" has disappeared from his position above the front entrance and, instead, numerous replicas of that genial gentleman have been distributed to various stands in the Exhibition, a daily prize of one guinea being offered to those who discover him engaged on certain named occupations, simple clues being given in the Glasgow Press. There has been a reduction in the Pavilion of the number of appliances on show, giving the interior a more spacious appearance. A working model has been installed, showing how benzole is brought from coal seam to carburettor, every stage in the process being clearly demonstrated.

The cookery demonstrations which are being given almost continuously in the Pavilion have proved immensely popular, and a feature has been the large number of men who have attended these. The demonstration theatre is not large, but on one occasion no fewer than 371 persons attended a single demonstration. This department, so far, has been in the hands of the Milk Marketing Board, the Potato Marketing Board, and certain manufacturers, and is definitely proving one of the most popular attractions at the Exhibition.

The staff of the Gas Pavilion have been responsible for a noteworthy effort on behalf of the Markham Colliery Disaster Fund. Well-known theatre artistes appearing in Glasgow responded to an invitation to attend the Pavilion and sign auto-

graphs for a small fee; hot drinks were dispensed to the public in the evenings in return for a voluntary contribution; and a dance was organized in a city ballroom, with the result that the sum of £100 was handed over to the Fund by the organizer. It is intended from time to time to make further efforts for charitable purposes. In addition, it is planned to hold mannequin parades, to organize a competition open to school children in connexion with the many uses of gas, and to run a balloon contest in conjunction with Glasgow Corporation.

An inaugural scheme of floodlighting has already been carried out at the Pavilion. It is planned to floodlight the Pavilion nightly, beginning towards the end of August. The comfort and warmth of the premises will enable it to hold its interest for visitors through the autumn. It has a homeliness not possessed by other buildings. As witness the lady who entered and calmly sat down in front of a gas fire while she changed her child's wet clothing! After all, the Pavilion is stressing the domestic use of gas and so thoroughly justified her action!

Gas Central Heating and Hot Water Supply.

In addition to their "Rex" No. 1 series boiler of 99,000 B.Th.U. capacity on the B.G.F. stand in the Palace of Engineering, Thomas Potterton (Heating Engineers), Ltd., are showing in the Gas Pavilion an example of their "Emperor" thermal storage set of the new pattern of 23 gallons capacity, together with a No. 1 "Emperor" circulator. The central heating side of their business is represented by a No. 2 series "Rex" boiler of a capacity of 288,000 B.Th.U. and a similar boiler of the No. 1 series of 66,000 B.Th.U. capacity.

Women's Gas Council Display.

In the Women of Empire Pavilion is the model kitchen designed by Mrs. Darcy Braddell—part of the exhibit of the Women's Gas Council. The object of this kitchen is to show how kitchen work can be made simple and easy by wise planning and by the use of appliances which are available to every home to-day. It shows, too, how the kitchen can be made bright and cheerful.

The Model Gas Kitchen—W.G.C. Exhibit.

It will be recalled that Her Majesty the Queen on the occasion of her tour of the Exhibition paused at the W.G.C. stand, when Miss K. M. Halpin, the Organizing Secretary, was presented to her. During the months the Exhibition is open, cookery demonstrations are being given daily in this kitchen. Experts are in charge of both kitchen and Inquiry Bureau, where any questions on problems of the home, in cookery or nutrition are answered and the work of the Women's Gas Council is explained to visitors.

On June 24 the stand was again visited by Royalty, when their Royal Highnesses the Duke and Duchess of Kent paid an official visit to the Exhibition, and among the pavilions included in their tour being that of the Women of Empire. Their Royal Highnesses in conversation with Miss Pearson, of the Gas Light and Coke Company, and Miss Hawkins, of Radiation Ltd., expressed interest in several of the exhibits, including the Electrolux refrigerator, the "Hot-meal" cabinet, and the latest "New World" cooker.

The W.G.C. Visit.

On Wednesday, June 22, about 500 members of the Women's Gas Council from all over England and Northern Ireland visited the Empire Exhibition, Glasgow. A party of 75 members from London and the South travelled through Tuesday night and arrived in the Exhibition Grounds early in the morning, and large parties from other districts arrived before noon.

The Birmingham Women's Gas Circle contributed a contingent of 116, who left overnight by special train from New Street Station. On arrival at St. Enoch Station, motor coaches conveyed the party to the Grand Hotel for breakfast, and later the members were driven to Loch Lomond via Stockiemuir, Gartocharn, and Balloch, and spent a short time cruising on the Loch. They returned via Arden, Blackhill, and Helensburgh, entering Glasgow by Dumbarton, where the "Queen Elizabeth" was seen in course of construction. The afternoon and evening were devoted to inspecting the exhibits, and the members entrained for the return journey at 11 p.m.

Throughout the day groups of members visited the Women's Gas Council Exhibit in the Women of the Empire Pavilion, where the advantages of the model kitchen were explained to members, and the use of modern gas appliances was demonstrated. There was a display of dishes cooked in the model kitchen; a meal was cooked in the "Hot-meal," and ice-cream made in the refrigerator.

In the morning, Sir David Milne-Watson visited the stand, and was welcomed by Miss Wolseley-Lewis, Chairman of the Women's Gas Council, and Miss K. M. Halpin, Organizing Secretary. Over 250 members of the Women's Gas Council had luncheon at the Restaurant of the Palace of Engineering, when Miss Wolseley-Lewis welcomed them to the Exhibition, and wished them an enjoyable visit. Glasgow members joined the visitors at this luncheon.

In the evening, the party from the South went to Edinburgh. They spent Thursday morning seeing places of interest in the City, and visited the Forth Bridge in the afternoon. In the morning those members who were engaged in demonstration work were shown over the Edinburgh College for Domestic Science, Atholl Crescent, and were entertained at lunch there by kind invitation of Miss Wingfield, Principal of the College. The party travelled back to London on Thursday night.

Asbestos Cement Products.

The majority of the Exhibition Palaces and Buildings have been covered with the products of Turners Asbestos Cement Company, Branch of Turner & Newall, Ltd. On every side visitors to Bellahouston Park see roofs and walls of asbestos-cement in some modern form. For interior work it has been used on walls and ceilings, in some cases in natural grey colour and in others with a decorative surface treatment. Special asbestos-cement mouldings are everywhere, and this is stressed by the makers, who claim that many of the problems of modern building practice which confront architects can be solved by collaboration with the asbestos-cement manufacturer. A comprehensive range of exhibits on the firm's stand demonstrates the extent to which specialization in the manufacture of asbestos-cement has produced in this versatile material a range of products for every phase of constructional work.

There are roofings of every description, from the heavy industrial type to the artistic asbestos-cement slates. Then there is a range of asbestos-cement sheets for interior decoration. There are glazed panels, stipple glaze and marbled glaze sheetings, and many other highly decorative wall coverings too numerous for mention here. Rainwater goods, soil pipes and fittings, ventilators, ducting, gable conduits, pressure pipes for gas and water—all are now available in asbestos-cement and possess its imperishable quality and freedom from all necessity for maintenance.

Babcock & Wilcox, Ltd.

This well-known firm are occupying two stands—one being in the Palace of Engineering and the other in the Coal in Home and Industry Pavilion, on both of which are exhibits typical of their own products and those of their subsidiary companies. Babcock piping is exemplified by a 16 in. bore corrugated expansion bend or cross-over piece. In addition a large selection of Babcock valves is shown, together with smaller exhibits such as a model of a Stirling boiler, fusion welded test specimens, flash welded test specimens, &c.

International Engineering Congress, Glasgow

The Gas Industry—

PAST, PRESENT, AND FUTURE

by
Sir DAVID MILNE-WATSON,
Bt., LL.D., D.L.

I.—The Past.

To look back to the first days of the Gas Industry in this country is to see a society still living largely in a pre-industrial age. True, crucial inventions in steam power had followed fast on each other between 1750 and 1800. But by the first decade of the nineteenth century, when the Gas Industry was struggling into life, only about three-quarters of a million tons of coal were being coked for iron production, a sure index of industrial activity. Coal was burnt raw for heat or steam power, transport was by coach or cart, and when night fell the world moved in the flickering light of oil lamps, torches, and candles. In the transformation both of productive methods and everyday life which has taken place since those days the Gas Industry has played a part of uncommon interest.

It has had a large share in two important changes. First, in the use of coal. Carbonization represents the fullest scientific distillation of the coal substance. In 1800, raw coal, burnt in inefficient appliances, was wasted on a national scale in clouds of smoke. To-day the Gas Industry alone is responsible for the scientific treatment of 19 million tons of coal; and if the carbonization of a further 20 million tons by the coking industry is added, it appears that almost a quarter of our present internal use of coal (175 million tons) is split by carbonization into higher grade fuels and chemical by-products. Last year the two industries together produced about 26 million tons of coke, 400 million gallons of tar, 250,000 tons of sulphate, and 50 million gallons of refined benzole. Here is the major change towards the scientific use of our chief raw material.

The second, and perhaps more striking, change brought by the Gas Industry was in the pattern of everyday life. It was as a giver of light in a form incomparably more convenient than any hitherto devised, that the Industry first grew up. Perhaps an old text book of 1882 may be quoted on this subject:

> "Civilized society is indebted for much of its industrial prosperity and material progress to the lighting of the public streets and roads by coal gas. The change to the present system from the old mode of public illumination by means of the ancient falot or fire-basin, and even the more modern train-oil lamp, with its uncertain glimmer, must be reckoned as one of the triumphs of the nineteenth century. . . . Under existing conditions the avocations of life can be pursued as easily and as safely by night as by day."*

If we think of the modern railway station by night, of continuous factory production, of night medical services, of trains, of the brightly lit streets, the enormous changes made possible by gas light will appear. Gas, be it remembered, came a full sixty years before electric light was heard of. In the citizen's home the effect was scarcely less important. Reading or study can be carried on by candlelight, and with such light the learned classes of England got on well enough. But it is hard to imagine public education, evening classes, evening hobbies in the days before gas lighting. When dark fell, the populations of London or Leeds were reduced to the present condition of a crofter in the Hebrides. Light was the first great advance in domestic routine, and the first historical achievement of the Gas Industry. For the first seventy-five years of its existence it was as a source of light that the Industry was known to the public.

* King. "Science and Practice of Coal Gas," 1882.

The potentialities of the new gaseous fuel and of coke for heating purposes were very soon realized by the progressive spirits in the Industry. By 1819 coke was being sold at about £1 per ton, and by 1841 the keenness of coke hawkers led them to bribe the Gas Light and Coke Company's workmen to give overweight in the sacks, which in those days were brought by hawkers to the works for filling. Designs for heating by gas naturally needed more ingenuity. In the very early days the sulphur content in the gas was high enough to make flueless heating difficult, and in any case efficient burners were not developed.

Such difficulties only spurred on inventive enterprise. On the manufacturing side a continual increase in the yield of gas per ton may be noted. Partly owing to the need for high illuminating power, partly owing to the use of cast-iron retorts, carbonizing temperatures were at first low (750° C. to 900° C.), with a consequent low yield of gas. By 1850 fire-clay retorts were in successful commercial use, and by 1885 the yield of gas had risen from 6,000 cu.ft. to 10,000 cu.ft. per ton. Purification and by-product recovery offered, then as now, a host of chemical problems. The first impurity to be systematically removed was sulphuretted hydrogen, and that by the simple process of bringing it, under an 8 or 10 in. water pressure, into contact with quicklime. Naphthalene was retained in the gas to increase illuminating power, and in consequence it blocked the pipes. Sulphur removal, on the other hand, early became of great importance, since early lighting without the incandescent mantle used a great deal of gas, the products of combustion remaining in the room. Lime was used as the purifying agent and, though efficient, it was unpleasant to handle. Iron oxide was discovered in 1850 to be a more convenient purifying agent, and as early as 1875 sulphur was being extracted from the spent oxide in commercial quantities. But the growth of its use was slow, since it left small quantities of sulphur compounds in the gas. Simultaneously, tar distillation proceeded rapidly, one important discovery being the isolation of benzene from tar by Dr. Hofman, and the subsequent discovery of the production of aniline dyes from benzene by Perkin. By 1880 benzene, toluene, and xylene were coming widely into use. These technical developments are mentioned in order to show the great distance which the Gas Industry was forced to travel in its development to its modern position as a source of purified fuel and as a great chemical industry.

As regards the uses of gas, technical development was early astir. About 1840 the first gas cooker made its appearance, by 1853 gas fires, in full Victorian decoration, were on the market, and in 1854 a gas poker, designed almost exactly as its modern counterpart, was first manufactured. The invention of the Bunsen burner in 1855 gave an enormous stimulus to the use of gas for heating, and by 1869 the first hiring scheme for cookers was put into operation by the Crystal Palace District Gas Company, with a rental of 1s. 6d. per quarter. By 1880 the technique for the use of gas for domestic cooking and heating was remarkably well developed.

It is noteworthy that this technical advance largely outran the commercial ability of the Industry to sell its new products. Marketing in the modern sense of the word was barely known, and there was little study of the needs or habits of the consumer. The Victorian preference for an open coal fire was simply pilloried as a prejudice. But it was a valuable prejudice; for, as an early technician remarked: "To meet the wishes of that unreasoning portion of the community which liked its source of heat to be bright,

two classes of stoves have been designed—viz., the 'cheerful' stoves and the class known as 'gas fires.'" Thus, if a little unwillingly, the Industry began to cater for the more human needs of its consumers. Except for a very few industries producing cheap commodities of universal daily purchase, marketing in the modern sense of the word was, in the nineteenth century, non-existent. That is why, in the Gas Industry, such inventions as the gas-ignited coke fire or the gas poker had to wait sixty or seventy years for their full commercial development.

Between 1880 and 1900 came a crucial period for the Gas Industry. After the Electric Lighting Clauses Act of 1882, the use of electric light began to expand. However, the Welsbach incandescent mantle (1895), which reduced consumption of gas for a given candle-power by three-quarters, not only strengthened the competition of gas lighting, but, perhaps more important, made it possible to use a gas of lower illuminating power, giving a higher yield per ton and greater economy for heating purposes. By 1900 the Industry was already setting its face to development principally as a heating agent, with cooker, gas fire, primitive water heater, and industrial gas furnace as its weapons. Between 1900 and 1920 the first main commercial development of these uses took place. The cooker had already reached a fairly high standard of development; improvement in refractories and the technique of instantaneous water heating helped the other appliances to catch up. Figures of production show how rapid was the growth of the Industry in this period:-

TABLE 1.—*Development of the Gas Industry.*

Year.	Coal Carbonized.	Consumers.
1894	11 million tons	2·5 million
1904	14 " "	4·7 "
1913	16 " "	8·2 "

Perhaps it should be mentioned that the national need of explosives in the War started a new form of production in the Industry. In 1913 the first benzole extraction plant was put down by the Gas Light and Coke Company. In the War years the whole Industry started production, with a total output of some 21 million gallons.

If the development of the Gas Industry from 1812 to 1920 is to be summarized briefly, three periods may be roughly distinguished. From 1812 to 1880 light was the main product, and a monopoly product, of the Industry. Simultaneously, rapid progress was made in the technique of production and the invention of heating appliances; but the commercial development of the latter was delayed. Between 1880 and 1900 came competition from electricity for light, and a change of emphasis in policy which began development of heating uses on a large scale. Significant in this period is the incandescent mantle and, it should be added, the invention of the slot meter in 1894. The third period, 1900-1920, covers the main commercial development of the three main domestic appliances—cooker, fire, and water heater—and an increased use of gas for heating in industry. With a fine record of technical achievement and a wide field for possible development as a source of heat, the Gas Industry faced the social and industrial revolution of the post-War period.

II.—The Post-War Gas Industry.

The special demands of the War not only stimulated both production and technical progress in many different parts of national economy, but inevitably threw out the natural economic balance. Some industries were neglected, others unhealthily swollen. The State, looking to the future, felt some responsibility for planning a wise peace-time development of our resources, and among them the fuel industries. In 1919 the Electricity Commissioners were appointed with a view to the reorganization of electric supply, and in the same year the Fuel Research Board, dealing with the fuel problem as a whole, reported in words which are of high importance:

> "The sheet anchor of the Gas Industry in the future must necessarily be its possession of the cheapest known means of distributing potential heat energy in a convenient form. For lighting and power production the electricity supply industry of the future may seriously contest the field with the producers of gas, but for the supply of heat gaseous fuel ought to remain supreme if its production and use are developed on sound lines."

Here was a direct lead to the Gas Industry from an impartial body of the highest technical ability, and the Industry was not slow to take the hint. In 1920, as a symbol of its intentions, the thermal standard of selling gas was adopted, and production as a whole was standardized at a lower level of calorific value than that current before the war. In future the consumer was to buy heat and pay for it directly.

Whatever the future before the Industry in 1920, it would certainly be one of strong competition in a time of changing conditions. The Industry set itself to strengthen its power and improve its methods. Its first task lay at the gas-works, and in the post-war years it achieved a remarkable advance in the technique of production. The improvement of refractories, including the use of silica retorts, was an important first step. Carbonizing temperatures were increased, with a consequent higher yield of gas per ton. The widespread introduction of vertical retorts was a powerful factor in increasing efficiency. This method of carbonization had first been adopted in 1908, but had not spread rapidly until after the War. The lower standard of calorific value brought into full effect the peculiar advantage of the vertical retort—namely, the possibility of "steaming" the coke in the retort, thus producing a water gas which is mixed with the richer coal gas found higher in the retort. The total yield of gas is thus considerably increased. A host of other particular improvements contributed to a final rise in the average yield of from 65 to 75 therms per ton; individual companies to-day may obtain up to 93 therms per ton, or about 18,500 cu.ft. against the 6,000 cu.ft. obtained 100 years ago.

Purification and by-product recovery were also tackled. Only in the post-War years had the problem of naphthalene removal been resolutely faced. It was solved, and water trouble was removed by drying the gas; only to bring up another problem. Small quantities of a sticky gum were found to be impeding appliance operation, gum which before had probably been concealed in naphthalene deposits, or deposited in the damp atmosphere of the holder. Prolonged research was necessary to cure this trouble. Another object of attack was sulphur. Technicians, seeing the possibility of developing flueless heaters, started an attack on it, using catalytic and other methods to supplement oxide purification. That attack is continuing to this day. So the tale of steady technical advance could be continued.

But efficient production was not enough. In 1925 the Weir Committee reported on the national development of electricity supply, and in 1926 the "Grid" obtained legislative sanction. The striking nature of this scheme appealed to popular imagination. The newspapers were full of stories of the great new national service which was planned; and this at a time when the Gas Industry, however good its service, existed in the consumer's mind not as a national institution but as a local company and a "gasometer" behind the back garden. Visions of an all-electric age were conjured up, and each new extension of pylons and cables sharpened the public vision of the "shape of things to come." Invention of electrical appliances proceeded fast, and it was not long before domestic fuel appliances were appearing in quantity on the market, with all the glamour of fashion and modernity to help the buyer.

This was a threat which the Gas Industry could not neglect. Modernization of appliances and of its whole contact with the public was its next and urgent task. Research in the Industry was strengthened, with a view not only to efficiency but to appearance. Very soon results began to show. In 1928 the first enamelled gas cooker came on to the market, a vast improvement over its blacklead predecessor in appearance, in the speed and economy of its burners, and in insulation. Between 1928 and 1935 the whole new armament of the Industry was forged: In 1929 the modern coke fire, in 1930 thermostatic control on cookers, in 1930-1931 the new water heaters in white enamel, in 1933 new streamlined coloured gas fires, and in 1935 (on a large scale) refrigerators. Nor was this advance a matter of fair seeming only. The modern domestic appliance is about 20% more efficient than its predecessor of fifteen years ago, a difference meaning perhaps 2d. per therm in the consumer's gas bill. With this

new equipment and with better service the Industry strengthened its grip on the domestic market, and cast round for a yet wider field of development.

Changes both in productive methods and in social structure offered just such an opportunity. In industry post-War competition strengthened the drive to economy, and better costing methods found the weak spots. Industrialists learnt, perhaps first from electric power, that the prime cost of fuel for heat or power was not necessarily the criterion in choice of methods. Cleanliness, control, automatic operation, saving of space and labour are advantages which can finally be expressed in terms of pounds, shillings, and pence, and the growth of electric power and gas heat in industry represents a parallel development, based on higher efficiency in lieu of low first costs. In the last ten years, and perhaps particularly in the last five years, gas found uses in heavy industry which it could not have hoped to gain before the War.

It was not only in old-established spheres of use that gas had opportunity to advance. New industries—motor, aircraft, wireless—sprang up after the War, and quickly moved towards the new technique of mass production. Clean, controlled, and continuous working was of great importance, and here again both the gas and electricity industries found a new outlet. Apart from these major industries there sprang up a number of smaller light industries, manufacturing a whole range of new accessories and knick-knacks of which the plastics industry is perhaps the most protean. For such production, accessibility of large markets, and in particular of London, was of great importance; and they were enabled to settle next the market rather than near a coalfield, because gas and electricity were available. In these new consumers the Gas Industry began to find a rapidly growing market; and to-day there are companies in industrial areas selling 30, 40, or even (in Sheffield) over 60% of their gas output for industrial uses.

Meanwhile the growth of large block buildings and large public restaurants, a rising standard of living with a demand for additional comfort in shops and offices, gave rise to a new commercial demand for gas and coke. Large-scale catering and the food and confectionery trades modernized their methods with a tendency to form fewer and larger units, and the Gas Industry was able to provide an ideal fuel for this class of cooking and food production. The demand for central heating expanded and with it the use of coke, or, more recently, of gas. Particularly in the South, the commercial uses of gas steadily increased. Continual research on industrial and commercial appliances ensured for the Gas Industry a renewed reputation for enterprise and modernity.

The new uses for gas in industry and commerce, combined with a renewed attack on the domestic market, kept up a steady expansion in production. Despite the depression of 1930-1933, the average annual increase in gas sold between 1921 and 1936 was over 5,000 million cu.ft., a total increase of 35% in 15 years. To-day the Industry has reached a higher level of production than ever before. Some idea of its national importance is given by the statement that it employs directly some 125,000 workers, with a vast total of work given indirectly. For example, some 75,000 miners are employed in mining gas coal, and probably between 20,000 and 30,000 men in making gas plant and appliances. The Industry ranks seventh as an employer of labour in the country. Capital invested is estimated at about £200,000,000. As regards production, the annual output of energy is about 1,500 million therms, about 2½ times the output of the entire electrical industry. Lastly, a fact which earns for the Industry its title of "Public Utility," it has nearly 11 million consumers, out of about 12 million families living in the United Kingdom. Despite twenty years of fierce competition it has established itself and grown in its new *rôle* as a source of modern heat service.

III.—The Future.

The future development of the Gas Industry depends upon the form which future social and industrial demands for heat may take. There are certain demands for energy which are at present met by petroleum, and of these nothing need be said. Coal remains our chief source of energy, and it is with the various possible uses of coal that the Gas Industry is concerned. Coal can be burnt raw, or carbonized, or used for electricity generation. On a long view, the question to be decided may be put thus: Where there is a demand for light, heat, or power respectively, in what way is coal best used to meet it? It is easiest to deal first with the question of conservation of energy and cost, and later to consider the broader social implications of a given choice.

A few simple facts will give a general indication of policy in using coal. Carbonization at gas-works is to-day a process with a thermal efficiency of over 80%. Neglecting by-products, it may be said that from 100 potential heat units in coal, 50 are recovered in coke and 25 in gas. On an average to-day the same 100 units give 20 units in the form of electrical energy. For some reasons a comparison of electricity with gas and coke is awkward. To obtain a direct comparison between gas and electricity, some allowance must be made for coke. This is easily done, by considering what may be called the net consumption of solid fuel for a given quantity of gas or electricity. One hundred potential heat units in coal give, by carbonization, 50 in coke. Thus there has been a net consumption of 50 units of solid fuel, and a production of 25 potential heat units as gas. A consumption of 50 units of solid fuel for electricity generation would give only 10 units. Thus a direct comparison is obtained in which the ratio of energy recovered by carbonization as against electricity generation is as 25 to 10, or 2½ to 1. It follows from this that electricity must be 2½ times as efficient as gas for a given use if the consumer is to get an equal amount of work done from a given quantity of coal. Now as far as light and power requirements are concerned, electricity may well have this advantage in efficiency. But for heating purposes it has not. For example, in domestic use gas is perhaps 50% efficient on an average, electricity 75%—a ratio of only 3 : 2. In a word, the high thermal efficiency of carbonization and the efficiency in use of gas make carbonization by far the most economical method of treating coal for heat production.

It is safe to say that comparative costs correspond roughly to the energy equations given above. Although costs to the consumer may be disguised in various forms of tariff, the words of the Fuel Research Board remain as true to-day as they were in 1919. Carbonization represents "the cheapest known means of distributing heat energy in a convenient form." One hesitates to take any concrete example, but if the average cost of electrical current to-day is taken as just over 1d. per unit, and the average cost of gas at 8d. per therm, the comparison in cost of potential energy is between 2s. 6d. and 8d. per therm. This is a gap which no probable difference in heating efficiency will bridge.

Such a discussion of methods of using coal for heating may seem to take too little account of what is, after all, the most widespread method in use to-day—that of burning it in its raw state. In large boiler installations this is a very efficient proceeding; in the old-fashioned domestic grate and range, where the efficiency is 15 or 10% and the dirt, labour, and smoke it causes is endless, it is little short of a national reproach. Each form of use must be judged on its merits; but there is a general line of development which is worth a thought.

In the last century, naturally enough, production was the goal of ambition in this country. In the course of industrial expansion green fields were turned into factory dumps, the skies were veiled in smoke, streets and buildings turned grey or black by the coal smoke and dirt in which prosperity disguised itself. Science applied itself to productive ends, leaving human life to get on as best it could. In this century, and particularly in the post-War years, there has been a great effort to make science and productive technique serve human ends more directly. On the one hand, there is an attempt to make production cleaner and more compact. In place of a sprawling, smoky area of small industrial plant, to-day a larger unit, smokeless and better placed, may be used. Inside it, hot, dark, and dirty conditions of labour may be replaced by better and more efficient arrangements. On the other hand, science has begun to look inside the citizen's home, and has found there conditions no less ready for improvement. Without labouring this point, it is clear enough which way the wind blows, and how great a part efficient use of energy for light, heat, and power must play in further pro-

gress. It is because the Gas Industry is uniquely fitted to provide heat in scientific form in a period of increasing industrial efficiency and rising standards of home life that its future will be no less, or more, important than its past.

Such a generalization, implying an increasing use of coal energy in gaseous form, needs more precise justification. As regards the industrial uses of gas and coke, there is no need to say much. Gas has won its way on its own merits in many industries, of which perhaps the most important are steel, pottery, motor, aircraft, chemical, electrical, plastics, and food. The "hard-headed business man" has chosen it because it pays, and chosen it with increasing frequency in the last few years. As the Gas Industry further increases its research and progress in meeting industrial needs, and as a more suitable tariff policy is more widely adopted, there is every reason to think that the industrial users of gas will steadily increase. Replacing only the inefficient applications of raw coal, and bringing the advantages of smokelessness and good working conditions, gas should simultaneously contribute largely to social advance on the productive side.

Domestic fuel requirements present a more complicated problem. The housewife buying fuel is not technically educated in costs or efficiencies, and buys partly from tradition, partly from a rather uncertain idea of first costs. Comfort and convenience may appeal strongly to her, but in the great majority of cases will be sacrificed to a real or fancied economy. Tradition establishes the burning of raw coal in the home, and changes in that tradition are slow, and must prove their claims to economy in face of a presumption of higher cost.

It is estimated to-day that, of the total domestic demand for heat, 53% is met by bituminous coal, 4% by anthracite, 19% by coke, 19% by gas, 1·5% by electricity, and the remaining 3·5% by oil and kerosene. Dividing these totals in one way, it appears that 76% of requirements are met by coal or coke. Another division shows that, counting oil as smokeless, 47% of requirements are met by smokeless fuel, of which 38% is provided by the Gas Industry. However these figures are regarded, the salient facts are the dominant position of raw coal, the even stronger position of solid fuel, and the large contribution of the Gas Industry in comparison with electricity. Common experience in the actual use of fuel in the individual home shows that raw coal is mainly used for the open fire and the range. Cooking is mainly carried out by gas; there are more than 8 million gas cookers in use to-day among 11 or 12 million families. Latterly the electric cooker has taken a small share, with 750,000 cookers in use. Water heating is shared by the "back boiler" behind a kitchen range, and the coke boiler, with help from instantaneous gas water-heaters and a small number of electric appliances.

The existent hotch-potch of fuels in the ordinary home gives a very unsatisfactory result, particularly for the lower income levels, where bad planning cannot be off-set by extravagance. In the first place, the use of raw coal in domestic grates is responsible for three-quarters of our national smoke problem, which in money alone is reckoned to cost over £1 per head of the population per annum, and in damage to health and the amenities of life is still more objectionable. Secondly, it is thoroughly inconvenient, and in most cases inefficient. The labour and dirt caused by using raw coal in old-fashioned domestic appliances needs no description. In the working-class home, where the coal range even to-day is asked to warm a room, cook food, and heat water simultaneously, the result is to turn the living-room into the kitchen, to get no hot water in summer save by roasting the family, and to fill the skies with wasted fuel. In Europe, since the days of Elizabeth at least, the inhabitants of these islands (more especially perhaps the southern fragments thereof) have had the reputation of knowing how to live well. The Briton's beef and beer, and all that is imagined to go with them, have represented an almost legendary standard of comfort. But whatever may be the repute of our larders, the national trick of looking after ourselves has not extended to our household equipment, and particularly our method of keeping warm. For the time being at least we must hope that no over-inquisitive European critic will pry too closely into our domestic fuel arrangements.

In contrast to a smoky, laborious, dirty, and inconvenient fuel system, a system smokeless, labour-saving, clean, and convenient is the obvious need. The Gas Industry is able to provide such a system. Not only does it offer gas, to cover at one step the difference between smoky solid fuel and clean, automatically controlled heat, but it has a half-way house of the greatest value, a smokeless solid fuel. The extent to which this fuel service provided by the Gas Industry can in fact be used to effect an improvement in standards must depend very largely on cost. That subject is dealt with later. First, alternative developments need a word.

Coal technicians have made a great and most creditable effort in the last few years to improve the efficiency of coal burning appliances and at least to reduce smoke production. Whereas an efficiency of 10 or 15% was general in the older appliances, to-day 25% is possible; smoke can be reduced on lighting by gas ignition, though for the rest of the day smoke production must proceed as usual. Now, if to-day the Gas Industry did not exist and carbonization were not invented, it is interesting to picture the excitement which might be caused among these same coal technicians, if it were discovered that their problem of efficiency and smoke had been solved by the possibility of economic large-scale pre-treatment of coal. No amount of devoted tinkering, however skilful and well intentioned, can be a substitute for carbonization, and for that reason the domestic future of the fuel industry lies in taking coal from the mine not into the kitchen range or fireplace, but mainly to the retorts of a gas-works.

With regard to electricity, very little need be said here. To-day the electrical industry, with the aid of a progressive tariff—it might almost be called futurist—is competing fairly strongly with the Gas Industry for a share in the domestic heating load. Considering the small percentage of that load at present met by electricity, and the colossal expenditure which would be necessary to raise that share from 1·5 to 20%; considering, too, the natural thermal disadvantage of generation as against carbonization and the associated disadvantage in cost, it is safe to assume that any wholesale assumption of domestic heating by electricity is unlikely. Indeed, those who have taken a long view in the electrical industry have come to the same conclusion. The Gas Industry has, so to speak, a natural aptitude for domestic heating in the future which is not shared by any other industry.

Without a concrete example of what the Gas Industry can do in the way of convenience and cost, what has been said might seem airy. The hardest test for the Industry must lie where considerations of cost are most important—that is, in the working-class homes. If gas and coke can there provide a fuel system which is really worthy of the twentieth century and within the weekly budget, then the case for a gas domestic heat service is proved. There are in fact many estates in the country where a combination of gas and coke is installed. The Author wants to say a word of an estate in which his own Company is specially interested simply because it is complete and because he knows most about it. At Kensal House, a new block of working-class flats built to re-house slum tenants, a complete gas and coke system is installed. Cooking and water heating are by gas cooker and multi-point water heater respectively, the living-room is heated by a gas ignited coke fire, and bedrooms are heated by gas fires. The whole system is thus smokeless and labour-saving to a very high degree. The question of cost has worked out to destroy all fears of extravagance, and indeed to make the older coal system seem extravagant by contrast. The average fuel expenditure of a London working-class home is estimated at from 5s. 6d. to 6s. per week. Kensal House gas, at its full cost of slot-meter consumers, costs 3s. 8d. per week, coke 1s. 7d., giving a total bill of 5s. 3d., well inside the necessary minimum. On the two-part tariff which will increasingly come to be the Gas Industry's normal method of charge, and which is already on offer, in typical forms, to about a fourth of the consumers in the country, the cost of this fuel service would be reduced to 4s. 4d.

This figure of an individual cost may seem a small matter to bring before an International Congress, but it is in fact a matter of vital importance. A matter of a shilling or two may stand between present-day working-class fuel standards and a very different future. When recently a sample of British post-war housing had to be taken for an international

comparison of European housing, seven estates were chosen, and all seven relied on the burning of raw coal. That will be different in the future and, if it is, much will depend on the economics of a gas heat service. The example given showed a service which gives an enormous increase in convenience and efficiency over older systems, including smokelessness, and gives it within present-day costs. It is not hard to imagine what instantaneous hot water, and a complete severance of kitchen and living-room (enabling kitchen equipment to be scientifically planned) means to the working housewife and the comfort of the family. It means at long last the possibility of leisure disassociated from the pother of cooking and dirty dishes, and an over-heated atmosphere in summer. It means, too, the chance of clean cities and sunlight unobstructed by fog.

Moreover, as has been pointed out, the example given represents far less than the Gas Industry can do. The overheads of supplying a consumer with one or two therms per week are high in relation to the cost of gas itself, and the cost per therm must be high. But where anything like a complete gas heating service for cooking, hot water, and occasional heating is installed, this difficulty fades. A tariff becomes possible, in which the overheads are covered by a standing charge, or a relatively high charge for first small consumption, while the rest of the gas costs no more than about 4d. per therm. Tenants at Kensal House use about 4 therms per week. On such a tariff their bill consists of 1s. 7d. for coke, 1s. 5d. standing charge for gas, and 4 therms at 4d.—*i.e.*, 1s. 4d.—making a total bill of 4s. 4d. This represents a saving of well over 1s. on the average for London, a saving combined with a far better fuel service.

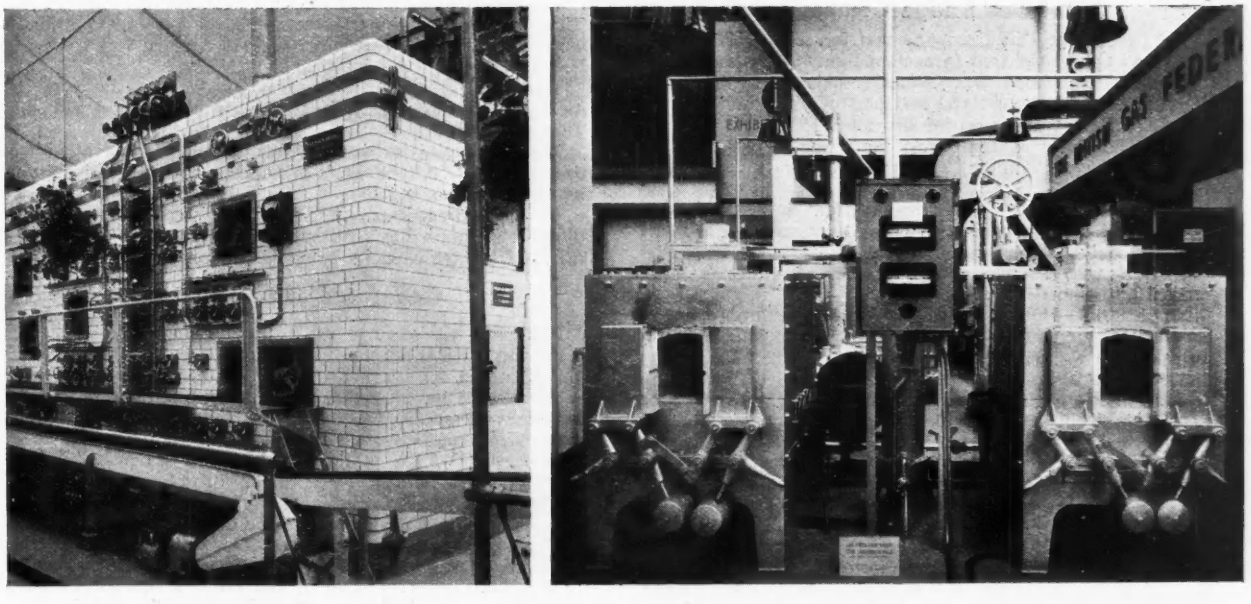
Here the root of the problem is reached. That shilling or more would provide over three therms more gas, enough to bring the consumption of hot water in the bathroom well above the Ministry of Health's ideal standard for working-class families; indeed, well above the average middle-class standards. Moreover, it would leave a further useful margin for adequate bedroom heating.

To put the general case: Present fuel systems are a mixture of gas cooking, coal space heating, and coal or coke hot water supply (if any). A gas consumption for cooking alone means that gas must always cost something between 7d. and 11d. per therm. But if the water heating and some space heating is added, then these extra loads can be carried at a running charge of about 4d. per therm. At that price gas is competitive on first cost with raw coal, and both socially and domestically advantageous. It is a matter, as pointed out above, of taking coal to the gas-works rather than the grate, so that one cost of fuel distribution is spread over the whole domestic heating load, where to-day two distributive systems are piled separately on to cooking and space heating respectively.

To sum up: The future of the Gas Industry in domestic supply lies in the rationalization of fuel service for heat by the concentration of the main cooking, space heating, and water heating loads under one set of distribution costs. For some years to come a smokeless solid fuel will necessarily split the space heating loads; that fuel the Gas Industry possesses in coke. A longer vision of the future might picture a time when gas, for its cleanliness and convenience, had taken that share too. In preparation for that day the Industry to-day is busily studying the problem of complete gasification of coal with no solid residue. Such a development of space heating and water heating demands enterprise, and demands above all a vigorous tariff policy. If the Industry has been sluggish on this point in the past, that is partly due to legislative restrictions. To-day it is awake and moving forward.

If the future here outlined for both the domestic and industrial functions of the Gas Industry is achieved—and there is no reason in the world why it should not be achieved—then the Industry stands ready to effect a second revolution scarcely less important than the introduction of gaslight at the time of Waterloo. The Industry to-day is strong, modern, well equipped. With almost 150 years of progress behind it, it turns confidently to a new and bigger task.

Industrial Plant at the Exhibition



These two views from the Palace of Industry at the Glasgow Exhibition show, left, the white-tiled gas oven in which loaves are being continuously baked at the rate of 30 a minute, and, right, the Sheffield Gas Company's patented atmosphere control furnace on the B.G.F. Industrial Gas Exhibit. The baking oven is a particularly effective piece of propaganda for gas, and is attracting a great deal of attention. Visitors pause to watch the whole process of bread-making from the sifting and blending of the flour to the automatic wrapping of the loaves which are produced at the rate of a loaf every two seconds.

Summer Meeting of the Southern Association

The Lea Bridge Welfare Institute, where the Association were entertained.

On Friday, June 24, members of the Southern Association of Gas Engineers and Managers were the guests of their President's Company, when a most enjoyable day was spent. No greater tribute can be paid to a popular President than to support him on what has come to be known among the various associations in the Gas Industry as "President's Day," and Mr. D. Cleave Cross must have felt proud and honoured at the number of his fellow-members and their ladies who accepted the generous hospitality of the Lea Bridge District Gas Company.

The Clerk of the Weather was consistently kind throughout the day, which added to the enjoyment of the occasion, while the hosts, recognizing that the ladies of the party do not always look favourably upon touring gas-works, provided alternative fare in the form of a cinema entertainment which was much appreciated.

The Lea Bridge Company.

The Lea Bridge Gas Company was formed in 1868, when the Works were purchased from the County and General Gas Consumers' Company. The Company supplies the district of Walthamstow, Highams Park, and part of Leyton.

Total length of mains on the district is 152 miles; the total area of the works is 16½ acres; the make of gas is 1,168 million cu.ft. per annum, and the number of consumers 44,625.

All the coal used is received by rail from South Yorkshire. The wagons are first weighed on a 42-ton rail weighbridge, and the coal is discharged by an electrically-operated side-discharging wagon tippler and elevated into stores or to either vertical retort house hoppers.

No. 1 Retort House, erected by West's Gas Improvement Company, Ltd., in 1914, contains six settings with eight retorts in each worked on the continuous system. The retorts are 33 in. by 10 in. at the top and 21 ft. long. The capacity of the house is 1¾ million cu.ft. per day. The coke extractor gear is operated by two 10 h.p. National gas engines worked in duplicate.

No. 2 House, erected by West's Gas Improvement Company, Ltd., in 1929, is designed to hold eight settings with eight retorts in each. At present there are only five settings completed with 40-in. retorts by 25 ft. long. The capacity of the five settings is 2·6 million cu.ft. per day. The house, when completed, will have a capacity of 4¼ million cu.ft. per day. The coke extractor gear is electrically operated. There are two waste-heat boilers of the Kirke patent horizontal fire-tube, induced draught type, each capable of evaporating 11,250 lb. of water per hour, at 120 lb. per sq.in. pressure.

The telpher system runs practically the length of the Works, and conveys the whole of the coke from the vertical retort houses either to the coke screening plant or to water gas plant. The total length is 1,133 ft. All coke from the retort houses is shot into a reinforced concrete night storage bunker of 100 tons capacity, from which it is elevated on a 26-in. belt conveyor to the grading screens on top of the concrete storage bunkers, which have a total capacity of 300 tons.

There are two twin sets of four-blade exhausters driven by steam engines of Waller's design with a normal capacity of 100,000 and 130,000 cu.ft. per hour respectively.

There are three steam-driven electric generating sets supplied by Sisson & Co. The capacity of the dynamos are two of 150 kilowatt and one of 100 kilowatt, generating D.C. current for driving the various plants on the Works.

The battery of three Lancashire boilers of the Thompson dish-ended type, with Wilton's forced draught furnace, are connected to the common steam main from the water gas boilers and the retort house waste-heat boilers.

The coal gas is cooled before passing to the exhausters in three one-million Clapham's "Eclipse" reversible water-cooled tubular condensers.

The gas, after leaving the exhausters, passes through three two-million Livesey washers, and then through two Holmes' rotary washer scrubbers worked in parallel. The coal gas purifiers comprise two parallel sets of 5 boxes at ground level, with overhead reinforced concrete revivifying floors common to both sets. The boxes of the older section are 30 ft. square by 6 ft. deep, with Milbourne's duplex valves, and the newer section 35 ft. by 30 ft. by 6 ft. deep, with upward and downward flow valves.

The oxide from the purifiers is handled by means of portable belt conveyors and a bucket elevator.

The water gas section comprises four 25 ft. by 20 ft. by 6 ft. boxes also at ground level.

The water gas plant was erected by Humphreys & Glasgow. There are three carburetted sets—viz., 1, 1½, and 1¾ million cu.ft. per day. The two larger sets are coupled with a waste-heat boiler which was installed in 1922.

The coke for the plant is raised to overhead hoppers by means of an automatic hoist worked in conjunction with the Telpher conveyor.

The water gas is exhausted from the relief holder by either of two 80,000 cu.ft. Waller's exhausters, with belt drive from two Crossley gas engines.

The gas storage capacity usually expressed as a percentage of the maximum day's output, is now approximately 80%, the total storage capacity being 3½ million cu.ft.

Governors and Boosters.

The gas is delivered to the district through a 16-in. feeder main and three water-loaded governors feeding 24-in., 18-in., and 12-in. mains.

There are two 600 mm. single stage Rateau type fans driven by steam De Laval turbines, for increasing the pressure of the gas between the gasholders and the inlet of the governors. The gas in the feeder mains is boosted during hours of heavy demand by a Rateau turbo-booster.

The mixed gases on the inlet of the gasholders are passed through a Holmes' calcium chloride dehydration plant and a horizontal naphthalene washer. Gas oil is used in the naphthalene washer.

The stores, cooker cleaning, and fitting shops have within the last few months been re-organized, and the buildings reconstructed and re-equipped and modernized.

The Chief Offices of the Company containing the staffs of the Engineer, the Secretary, and the rental department, are in a block of buildings at the entrance to the Works. The Gas Referees' Official Testing Station is now on the Works, and the prescribed testing apparatus is a Fairweather recording

calorimeter. The laboratories are in a separate block of buildings where the usual routine tests are carried out.

Entertained by the Company.

Following the tour of the Works, the members re-joined the ladies in the Welfare Institute. The latter is a very fine building constructed in 1931 and includes a hall where dances, whist drives, and dramatic entertainments are held, together with a large billiard room upstairs. Here luncheon was provided at the kind invitaton of the Chairman and Directors of the Lea Bridge District Gas Company—Mr. G. W. CAREY (Deputy-Chairman) presiding.

The Loyal Toast having been duly honoured, the CHAIRMAN proposed the toast of "The Southern Association and the Guests." Mr. Carey apologized in the first place for the unavoidable absence of the Chairman of the Company, Mr. A. M. Paddon, and went on to extend to the Association and their ladies a very hearty welcome on behalf of the Directors of the Company. He hoped that the members who had inspected the works had not spent an unprofitable time; there were certain points of difference between one works and another throughout the whole Industry, and he trusted that some of these points of difference at Lea Bridge had interested them. He recalled that the last visit the Association paid to Lea Bridge was in 1906, when the late Mr. W. F. Cross, father of their present President, was President of the Association. At that time their output was 260 millions, while their consumers numbered 8,000. To-day their output was 1,100 millions, and they were serving 45,000 consumers. That had necessitated re-modelling—indeed, practically re-building—the gas-works. That undertaking was commenced by their President's father, while his son had carried on the work in an admirable manner—with the result that the works they had inspected that morning were, he hoped, both efficient and up-to-date. To all their guests he expressed his very great appreciation of the honour they had done the Company by their presence on that occasion, and he coupled with the toast the names of Mr. Cross and Mr. H. C. Smith; he drank to the health and prosperity of them all.

The PRESIDENT, responding to the toast, said he had been looking forward to this visit during his whole year of office, and now that it had come about he was very glad to welcome them. As President, he thanked Mr. Carey for his kind words, and expressed the hope that the members had enjoyed their visit to Lea Bridge; he was sure they had, for they liked to visit their President's works not only to support him but because of a genuine desire to inspect gas-works, renew associations, and see how problems were tackled on other people's works, and thus pick up useful hints. Mr. Cross said that he had been at Lea Bridge now for 34 years, and he had had the opportunity of watching the works grow from a very small concern to a medium-sized undertaking. They had experienced a very great acceleration of building in the district a few years ago, with the result that they had to extend their capacity very quickly. When the district subsequently became more or less "saturated" so far as building development was concerned they could look about them and see how the works required modernizing. They had commenced a re-building programme six years ago, and they were now on the last stage—namely, the modernizing of their offices—so that they were ready for any expansion that might occur in the future. He hoped they would be able to appreciate how they had been able to get the works into their present state of efficiency.

Continuing, Mr. Cross remarked how honoured he was personally by the presence of the Mayor and Mayoress of Walthamstow, and referred to their valuable public work in the district. He also drew attention to the Company's Welfare Institute, saying how interested they were in the welfare of their men. This was one example of the Board's interest. The room in which they were sitting was used by co-partners for their social functions, while the staff dined there every day. A small voluntary deduction was made from wages for sports and hospitals, and the co-partners had provided all the furnishings of the Institute themselves, including the billiard tables. In conclusion the President expressed his gratitude to Mr. H. C. Smith for obtaining permission to visit Hatfield House on a day when it was not usually open to visitors. Once again he thanked them for their support and hoped they would have a very happy afternoon.

Mr. H. C. SMITH (Past-President of The Institution of Gas Engineers) also responded to the toast, thanking Mr. Carey and his co-Directors for their hospitality and their invitation to visit the works and Mr. Carey personally for the kind way in which he had proposed the health of the Association.

Mr. F. BLACKBURN (Vice-President) proposed the toast of "The Lea Bridge District Gas Company," which was cordially accepted and briefly acknowledged by the Chairman.

A Visit to Hatfield House.

After luncheon, the company were conveyed by motor coaches through most delightful country to the attractive old market town of Hatfield, where, through the good offices of Mr. H. C. Smith, permission was granted to visit the residence of the Marquess of Salisbury.

This wonderful old Tudor mansion must be one of the finest country houses in England, and the state rooms and their contents are a veritable museum of English history. The banqueting hall, armoury, chapel, library, drawing room, and galleries were viewed with the greatest interest, the fine tapestries, paintings, armour, ancient volumes, and many other historical items, not to mention personal belongings of Queen Elizabeth, including her cradle, being pointed out. A walk round the beautiful gardens which surround the house brought a visit of intense interest to a close, and thereafter the members and their ladies were entertained at tea in the Hatfield Public Hall.

Here Mr. BLACKBURN took the opportunity of thanking Mr. Cross and the members of the Lea Bridge Gas Company for their hospitality, as well as the Marquess of Salisbury for allowing the Association to visit his house and grounds. The PRESIDENT acknowledged the vote of thanks and said how pleased they were to have the Association with them that day.

Returning to Lea Bridge the members took leave of their President with many expressions of appreciation of a day of exceptional interest and enjoyment.

Athletic and Social

Edinburgh Bowls.

A Corporation League Bowling Match on June 11 between rinks representing Granton Gas-Works employees and Education janitors, played on Roseburn Green, resulted in a tie of 31 shots each.

Inter-Gas Companies Bowls.

Once more the Norwich team proved victorious in the Inter-Gas Companies Bowls Tournament which was held at Great Yarmouth on June 11, but as a result of very keen and interesting play, it was not until the last wood had been thrown that decision was beyond doubt. The other Companies represented were Yarmouth, Ipswich, and Cambridge, the last-named being runners-up.

Worcester Employees Visit Glasgow.

Employees of the Worcester New Gas Light Company and friends visited the Empire Exhibition at Glasgow on June 11. The occasion was the Company's annual outing and a party numbering approximately 200 made the trip. Although theoretically a "day" trip, the party left Worcester on the Friday night and did not get back to Shrub Hill until Sunday morning. The party were met at Glasgow Station by Mr. G. P. Mitchell (Engineer and General Manager of the Company). The members then split up into parties and spent the day in the Exhibition. Unfortunately, rain came on later and somewhat damped the ardour of those who had planned to spend the evening in the Amusement Park, but cinemas in the Exhibition and Theatres in Glasgow provided satisfactory alternatives to wind up a very happy day. Naturally all visited the gas exhibit. A start for home was made at 1.30 a.m. on Sunday. The smooth running of the trip was due to the organization of Mr. K. H. R. Ham, Accountant and Commercial Assistant, to whom much credit is due.

G.L.C. Apprentices' and Trainees' Sports.

For the whole day of Thursday, June 2, the Gas Fitter Apprentices and trainees from the Gas Sales Department of the Gas Light and Coke Company competed with each other for medals and cups presented by the Company. The sports themselves were arranged by the two L.C.C. Institutes—Westminster Technical Institute and the Poplar School of Engineering and Navigation—which the boys attend for one whole day each week as part of their training for instruction in ancillary subjects.

Although the day was cold some of the times were very fast, the best being 11 1-5 sec. for the 100 yards. Both the Senior and Junior challenge cups were won by the Westminster boys representing the western group of apprentices whose main training is carried out at Watson House; the losers being boys representing the eastern side of the Company's area whose main training is carried out at Stratford.

The prizes were distributed by Mr. Michael Milne-Watson, Assistant Controller of Gas Sales; while Mr. R. N. LeFevre, Officer in Charge of Training, thanked the two Principals—Dr. J. N. Long (Westminster) and Mr. Paley Yorke (Poplar)—for the work they had done in making the day a success.

NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION

(*Concluded from p. 970 of last week's "JOURNAL."*)

Repairs. Setting "A."

The above repairs, which may be considered as experimental and preliminary to the complete repair of the plant, were made after a period of 3½ years' continuous working, this being from starting up on Dec. 5, 1931, until June 27, 1935.

By the selection of Setting "A" for letting down, the operation of the remainder of the bench was not affected and only while repairing the sixth chamber was it necessary to lower the temperatures of the adjacent combustion flues of B.1 chamber. The actual work was carried out by the builders of the plant and was done on a cost basis *plus* percentage for overheads, &c., which was considered most satisfactory in the circumstances. This included for the removal of the bulging, which was mainly confined to the bottom base plate fireclay course and the first two courses of silica panels in the side walls of the chambers, by using portable grinding machines, the repair of all cracks and broken brick faces with a special refractory cement reinforced with grog, and the pointing of all joints and treating of the whole of the internal walls with a special silica cement wash. The second item mentioned—*i.e.*, the repair of cracks—was necessary, and it had been the practice after the removal of the carbon during the scurfing of the chambers to fill in the cracks by using a special gun, but it was impossible to make any permanent repair and it was generally found necessary to refill after each scurfing. Some indication of the extent of cracking which had developed will be gathered from the photograph, fig. 1, taken while the plant was undergoing repairs.

The carrying-out of the work detailed above proved a somewhat arduous task, the narrowness of the chamber limiting the working space. This was especially awkward where grinding had to be done. It was possible to achieve the object in view by this method, but an examination of the finished work revealed considerable weakening of the structure.

The replacement of a cracked base plate casting, involving the removal of a portion of the front wall and the four bottom courses of chamber brickwork, indicated a much more satisfactory method of overcoming the trouble. The subsequent behaviour of this part of the repair under working conditions led us to the conclusion that the final repairs could best be accomplished in this manner. Careful surveys of the chambers revealed the fact that at least 70% of the silica work was in good condition and the replacement of the balance by new work ensured a considerably longer life than would be the case if only grinding were done.

The actual time required for the work on Setting "A" was three months, the chambers being put back into operation in October, 1935.

The necessity for proceeding with the repairs of the other three settings fixed the date for this work to be done during the summer months of 1936, after 4½ years' work. In the interval, reasonable time was allowed for the manufacture of the necessary material, a careful estimate having been made which included the renewal of at least 6 bottom courses of silica work and the fireclay blocks for the baseplates.

A Difficult Period.

As had been anticipated, this period proved the most difficult in the history of the plant, hanging-up of charges being more frequent. Fortunately this state of affairs did not include the "A" chambers, which rarely gave trouble in this respect and proved that the work done had achieved the desired result. We had not been quite so successful, however, with the repairs made to the cracks; a good many of the fillings had loosened and the growth of carbon behind the material gradually forced it out altogether.

In deciding on the above partial reset, careful consideration was given to these chambers, and owing to risk of their breakdown before the rest of the bench, which appeared very probable through the weakening sustained by grinding in the bottom courses, it was decided to include them in the scheme.

(AUXILIARY SECTION)

Chairman's Address

BY

G. NEIL,

Works Engineer, Southampton Gaslight and Coke Company.

Presented at the 36th Half-Yearly Meeting of the Association, held at West Hartlepool on Friday, June 10.

The carrying-out of the repair on the lines detailed necessitated the shutting-down of the entire bench in order that the work could be accomplished in the time available. By working to a carefully prepared schedule, however, we were able to reduce this period considerably. It had been estimated that, while the actual work was proceeding on one half of the bench, the other half would have ample time for cooling down; and by selecting the two settings nearest the quenching tower these could be put back into operation on completion. This could also be done without interfering with the remaining two settings where work would still be proceeding.

The adoption of the above method was also of considerable assistance when providing the necessary capacity of horizontal plant for replacement in the production of gas.

The actual work of repairing the chambers was again put into the hands of the contractors on a cost basis and included for the following:

(*a*) Partial reset of the bottom portion of the chamber, the actual extent of this to be determined in each case after examination had been made on cooling down.
(*b*) New work to be introduced to replace those parts of the side walls of the chamber most seriously fractured.
(*c*) In the event of the above being impracticable, the fracture to be shaped to allow for the fitting and suitable bedding of pieces of silica in dovetailed fashion.
(*d*) Less serious cracks to be filled with grog mixture.
(*e*) All joints to be pointed and finally the chamber walls to be washed with special cement wash.

From the table given below it will be seen how the work progressed.

Settings.	Date of Shutting Down.	Start of Repairs.	Completion of Repairs.	Drying Fire.	Charged.
C. } .. D. } ..	April 6, 1936	April 30, 1936	July 20, 1936	July 24, 1936	Sept. 2, 1936
A. } .. B. } ..	May 13, 1936	July, 1936	Sept. 17, 1936	Sept. 14, 1936	Oct. 14, 1936

Before proceeding with an explanation of the method employed by the contractors in replacing the bottom portion of the chamber a description of the construction is necessary.

By including a system of bonding in their design, the desired strength was obtained without resorting to cambering or arching while at the same time provision was made for the floors of the horizontal passes of the heating flues.

The connecting of adjacent chamber walls by the bonder bricks meant that these walls must be dismantled together. By opening the front walls of the bench it was possible to proceed with the pulling out, but very great care had to be exercised to ensure that the work above was suitably supported. This was done by means of small section steel joists supported by bottle jacks from the base plate castings. The photograph—fig. 2—shows the actual work in progress.

By dismantling alternative combustion flues sufficient sup-

port was provided to carry the intervening work and at the same time allow the necessary progress to be made.

At first it was intended to remove only six courses of silica panels, thus leaving intact the first bonding course, but owing to the majority of these blocks being fractured it was decided to extend the renewal by two extra courses. A further interesting development which was only brought to light by the removal of the old work was the erosion of the silica panels at the extreme end of the combustion flue and nearest the front walls of the bench. From the photograph, fig. 3, it will be noted that this was considerable and would, if allowed to continue, have soon led to a hole in the side of the wall of the chamber. Although space was extremely limited the work proceeded in a satisfactory manner and little difficulty was encountered in adhering to the arrangements for replacing badly cracked panels.

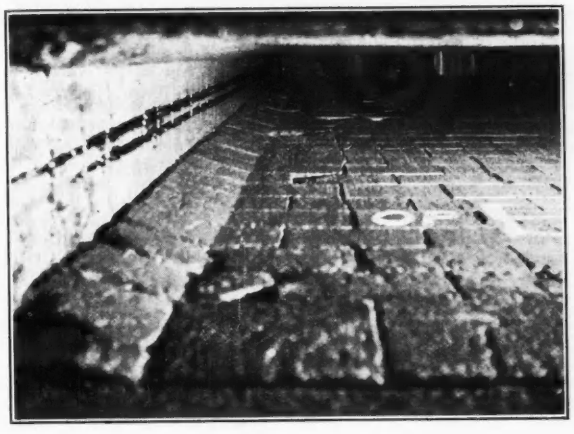


Fig. 1.

Possibly one of the most difficult parts of the repair was that of fitting the dovetailed shaped pieces of silica into isolated cracks. These were generally situated in the top half of the chamber where the width of the minor axis was not more than 10 in. It takes little imagination to realize how much movement is restricted in such a confined space, but by patient preparation of the bed reasonably good fitting of the silica pieces was obtained. After pointing and before cement washing, each chamber was subjected to a very careful examination to ensure that the entire work was satisfactory. Special attention was given in this respect to the old portion of the chamber which was expected to stand up to the life set by the partially reset portion. An important advantage gained by the entire renewal of the lower part of the chamber was that this included the rebuilding of the combustion flue. By making certain modifications in the construction of the floor of the above it was anticipated that seepage of molten ash would be prevented.

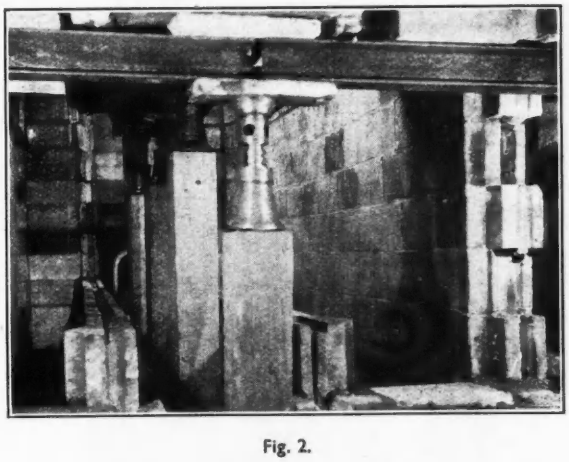


Fig. 2.

While the contractors were engaged in carrying out all repairs connected with the chambers proper, ample opportunity was afforded our own staff of thoroughly overhauling other parts of the plant.

Responsibility for the cleaning and examination of the recuperator and waste gas flues was included in the above as was also the repair of the producers. Considering the 4½ years which the latter had been in operation, they were in remarkably good condition, erosion of the side walls to the extent of a depth of 3 in. being found and, but for the repairs necessary to the chambers, a good deal further service might easily have been obtained. To the system of employing steam for cooling the fuel bed as well as injecting the primary air into the producer must be attributed such good results. We did, however, replace all defective work, having in mind the fact that, on returning to operation, it was anticipated that at least three years might elapse before further opportunity would be afforded.

Nothing of importance was found in either the recuperator or the waste gas main, but a rather alarming state of affairs was revealed in the steel chimney for disposing of the waste gases. While chipping the steel shaft in preparation for external painting it was found that at approximately 20 ft. from the top the ¼ in. thick plates were easily punctured. An internal examination was immediately carried out, and by removing the brick lining at regular intervals drillings were made from which the actual thickness was determined. By this means we were able to locate the position where corrosion was taking place, and we found that, although it was severe, the affected area was not too great and could be repaired by fitting patches inside the shaft. The cause of such corrosion as was found was due to excessive cooling of the waste gases with the resultant deposit of condensate on the inside of the steel shell of the chimney. When built, spaces for expansion of the lining had been allowed for, with suitable steel rings supporting the sections of brickwork. It seems very probable that the waste gases penetrated with more or less freedom into the space between the brick lining and the steel shell at this point, with the result that condensation was produced which attacked the ironwork. Steps were taken to prevent the recurrence of this, by packing the expansion space with asbestos rope. In a new carbonizing plant under construction at these works the waste gases, after leaving the waste heat boiler, are being disposed of through an auxiliary shaft which will also be lagged externally in order to maintain the temperature of the gases.

Fig. 3.

General repairs were also made to the charging car and overhead bunker ironwork. Special attention was given to the steel plating of the producer coke and rough breeze hoppers where considerable wear and corrosion had taken place. This work would have been more quickly and easily

done if bolting instead of riveting had been practised on erection for attaching those parts where corrosion, &c., could be expected.

Conclusions on the Repair.

At the time of writing, the plant has now been back in operation for over eighteen months, and I am therefore in a favourable position to inform you of its general behaviour under working conditions. Every satisfaction is felt at the excellent way the work done is standing up, and a recent inspection gives us every confidence that we shall get the anticipated three years' service. In fact, we think, that by continuing our present policy of working rather lower heats than those carried before the repairs we may be able to get a further year's life extra to the above. An alteration of the method employed for the removal of the scurf from the chambers is also playing an important part in their satisfactory behaviour.

After returning the plant to work on completion of the repairs we were able to adopt a form of continuous scurfing which, although brought to our notice some time previously, we had decided could not be put into operation owing to the poor state of the chambers. The new method is simple in operation and obviates the dangers of overcooling the chambers, which, although well known, somehow cannot be avoided where the human element has to be depended upon. Scurf is now removed after each discharging of the chamber and can be accomplished in from ten to fifteen minutes by leaving the bottom doors open and the top charging lids off. No fixed time is specified, the operator being allowed to use his own discretion, as it has been noted that different coals and circumstances lead to variation in formation of the scurf. The time required does not allow for making any repairs which may be necessary, but this has been overcome by instituting a system whereby, by delaying the charging of the chamber for one hour for a complete cycle at regular intervals, men can be employed to do the required work. It has been found that fewer repairs are required, which has led to a considerable saving in labour charges; a further advantage gained is the increased throughput of the plant, amounting to 4½% on the original tonnage of coal carbonized per day. This figure is based on a 12-hour cycle whereby the full 48 charges are obtained, equal to a total coal throughput of approximately 170 tons *per diem*.

It was on this cycle that the plant was put back into operation when the repairs had been completed, and by allowing 9 hours for carbonizing we were able to steam for 2¾ hours, the remaining quarter of an hour being required for discharging and scurfing.

Before concluding, I wish to refer to three points which I appreciate many of you, as practical men, will be most interested in—viz.,

(*a*) Thermal yield per ton of coal carbonized.
(*b*) Production costs.
(*c*) Maintenance charges.

For reasons given earlier in this Address you will also appreciate my difficulty in supplying these figures. However, I am able to state with confidence that when producing gas of 500 B.Th.U. per cu.ft. not less than 85 therms per ton are made.

In the case of point "b" it has been found that production costs are governed to a great extent by the conditions of the residuals markets. When these are normal the gas produced in the intermittent vertical chamber plant is definitely cheaper than that produced in the horizontal plant, but in the present artificial state of the coke market (and allowing for benzole recovery) we find there is hardly any difference.

Referring to point "c," for the first five years the maintenance cost was 6·58d. per ton of coal, which includes all costs of the repairs carried out by the contractor. Allowing for a complete reset after a further three years' life, it is anticipated that the overall maintenance figure will not exceed 1s. per ton.

Western Junior Gas Association

Summer Meeting at Dartmouth

A very enjoyable meeting of the Western Junior Gas Association was held on Saturday, June 18, when the members visited Dartmouth.

The party assembled at the gas-works at 3.15 p.m. and were welcomed by the Deputy-Chairman of the Dartmouth Gas and Coke Company, Dr. Harris. He apologized for the absence of the Chairman, and spoke in appreciative terms of the Managing Director, Mr. J. B. Cattle.

A tour of the works and showrooms followed, and though these are small, the arrangement is good, and lends itself to efficient working. The coal plant for unloading coal from the River Dart to the works was viewed with interest.

After the inspection members made their way to the quayside, where the river steamer "Totnes Castle" was awaiting to take them for a trip up the River Dart. This proved most enjoyable, as the weather was ideal.

In addition to the members, Mr. Cattle had invited some distinguished guests to accompany them. These included Mr. and Mrs. R. J. H. Clark, of Plymouth, Mr. and Mrs. H. H. Brown, of Exeter, and Mr., Mrs., and Miss Armstrong, of Ilfracombe.

During the trip Mrs. Cattle assisted by the ladies and a firm of local caterers were responsible for a very happy little tea party, this being part of the generous hospitality of the Chairman and Directors of the Dartmouth Gas and Coke Company.

Towards the end of the trip the President, Mr. J. E. Akroyd (Swindon G.W.R.) thanked the Chairman and Directors of the Company for their kind invitation to visit the works and take part in such an enjoyable trip. He especially mentioned the Managing Director, Mr. J. B. Cattle, who had made all the arrangements.

Mr. Cattle said how pleased he was to see the members, and and was glad they had enjoyed the trip. He would convey the thanks to his Co-Directors.

Trade Notes

The "Kula" Refrigerator.

We are advised by the makers that the recently introduced "Kula" gas-operated refrigerator is now in full production, and

that they can give prompt delivery. The accompanying photograph clearly indicates the useful storage capacity of the new model, which is 3 cu.ft.

Whessoe Foundry and Engineering

Record Results

The Eighteenth Annual General Meeting of the Whessoe Foundry and Engineering Company, Ltd., was held on Friday last at 25, Victoria Street, London, S.W.

Mr. HAROLD G. JUDD, C.B.E., C.A., Chairman of the Company, presided.

The SECRETARY (Mr. W. T. Pallin) having read the notice convening the meeting and the report of the Auditors,

The CHAIRMAN said: The report and accounts reflect the outcome of a year which in practically every respect constitutes a record in the history of the Company. It opened with a bulging order book, and it speaks much for the efficiency of the works that the large volume of orders was executed with the minimum of delay, despite the difficulty, which was general throughout the Industry, of obtaining adequate and co-ordinated deliveries of steel and other materials.

Widened Field of Activities.

It is of interest to note that the output for the year averaged well over 100 tons per working day. Although our largest field is still the construction of oil storage tanks and refinery plant, for which the Company maintains its reputation, a gratifying feature of the output is that it included a substantially larger amount of other products which your Company has been developing in recent years in an endeavour to widen the field of its activities. We are thus now beginning to reap the advantages of the policy of supplementing our competitive tank business with other lines. In these more specialized fields we are steadily building up a body of expert knowledge, which places us in the forefront and enables us to advise our clients in the gas, chemical, and iron and steel industries how their various problems can best be met.

In particular great progress has been made in the cleaning of industrial gases of all types. During the year we have submitted schemes to and received orders from the principal iron and steel makers both in England and Scotland for the cleaning of their blast furnace gases by our disintegrator process, which is now recognized as one of the leading processes in the country. In the coke oven industry our association with the Woodall-Duckham Company for the cleaning of coke oven gas by electrical precipitation has had most happy results, and we have also received many orders for our specialized electro-detarrers for gas-works both privately and municipally owned.

Our phosphoric acid pickling process, to which I also referred last year, is steadily becoming more widely known and appreciated, with the result that our pickling plant has been working 24 hours a day throughout the year, treating approximately 500 tons per week.

Storage of Petroleum Products.

Perhaps, however, it is in our old field of the storage of petroleum products that the most interesting development of the year has taken place. We have long sought to supply forms of storage in which evaporation is reduced to a minimum, and have in fact met with considerable success in this respect by the use of the Wiggins Patent Pontoon Floating Room. During the current year, however, active negotiations have taken place with our old friends the Chicago Bridge and Iron Company in connexion with the development of an entirely new form of container for the lighter forms of petrol now required by the motor car and aviation industries. This container is spheroidal in shape, with the result that the economical storage of light petroleum products under pressure becomes possible.

The results achieved by this form of storage have been remarkable, in many instances evaporation having been completely eliminated. I am glad to be able to state that a licence agreement is now in course of preparation whereby we, in conjunction with the Motherwell Bridge and Engineering Company, are appointed licensees for the manufacture and sale of this patented article in the United Kingdom and the British Empire, excluding Canada and dependencies in the Western Hemisphere. During the year we have appointed an engineer expert in the problems of evaporation so that we may recommend to our various clients the best forms of storage for their particular purpose. It is anticipated that very beneficial results will follow from this latest development.

Activities in South Africa.

I should also like to refer to the excellent work which has been done throughout the year by our agents in South Africa, Messrs. Fraser & Chalmers (S.A.), Ltd. Their hardworking activities have resulted in a steady flow of orders for the South African market, particularly in connexion with the goldmining industry. The whole of these orders, although in many cases both quoted for and received by cable, have been carried through without a hitch, and our association with Messrs. Fraser & Chalmers is a happy example of what can be done, even at long distances, when co-operation and mutual confidence exist.

Another direction in which much progress has been made is electric-arc welding. As a result of the research we have devoted to this type of work, we have succeeded in applying it to an extended range of constructional work with highly satisfactory results. In order to cope with this development we are erecting a new welding shop of greater capacity. That shop is being constructed with welded steel fabricated in our own works, and will, we hope, not only increase the capacity and efficiency of our welding department, but should serve as a demonstration of the advantages of welding for similar steel structures, thus opening a further field for the application of our welding work.

Works in First-Class Condition.

The works generally have been maintained in first-class condition; the principal shops and buildings have been painted both internally and externally, and central heating by means of unit heaters has been installed in our main constructional shop.

The increase in our staff, necessitated both by the increased turnover and by the specialized activities to which I have referred earlier, has involved enlarging our offices. The extensions should meet our requirements for many years to come.

While doing everything possible to maintain and improve the physical efficiency of our works, your Directors recognize that the human side is at least of equal importance. I am glad to say that we are fortunate in having a most competent and loyal staff, who have rendered whole-hearted co-operation with our Managing Director, Mr. Spielman, and I should like to bear testimony to the keen and enthusiastic spirit in which they have worked during a year of exceptional pressure. In this connexion I should like to refer particularly to Mr. Grant, the General Manager; Mr. Harrison, the Works Manager; and Mr. Martin, Manager of our London office; also to the harmonious relations which have continued with our workmen.

Bonus for Staff and Workmen.

In recognition of this and of the satisfactory result of the year's working, we have provided, as you will see from the accounts, a sum of £5,000 by way of bonus; a large part of this sum is being distributed to the workmen in the form of savings bank deposits in their individual names, which we trust may stimulate this form of saving. This bonus, which I am sure will have your approval, is, of course, in addition to the provision of a week's holiday with pay, which is extended to a second week in the case of men attending Territorial camps. In addition, there is the provident fund which was commenced for the staff some years ago, and the sports club, which is a much appreciated feature.

Turning to the accounts, I need say but little, as we have endeavoured to make them as explanatory as possible. The assets are all conservatively valued and provision has been made not only for all existing liabilities, but for taxation which may be assessed in future upon the profits of the year under review.

During the year we sold to Messrs. Henry Pooley and Son, Ltd., the weighing machine department, which was somewhat outside our normal work. The price included £5,000 for goodwill, and as you will see from the balance-sheet this sum, which was placed to capital reserve, has been applied by way of special depreciation and provision for demolition of the old welding shop.

Dividend of 30%.

Out of the profits of the year, which are the highest reached in the history of the Company, we have transferred a sum of £25,000 to general reserve, bringing that reserve up to £75,000, and we recommend the payment of a dividend of 30%, less tax, leaving to be carried forward a sum of £25,253, subject to the Directors' commission on profits provided for in the articles of association. It may be of interest to note that the business was founded nearly 150 years ago, and during the 18 years since the present Company was formed the dividends paid have averaged about 13% (less tax) per annum.

The current year has opened with a satisfactory volume of orders, and although in view of diminishing export trade one can hardly expect a repetition of the high level reached last year, there is reason to hope that the works may continue to be well occupied with remunerative work.

I now conclude by moving the adoption of the Directors' report and the accounts and the declaration of the dividend of 30%, less tax.

The Hon. A. H. SEDDON CRIPPS seconded the resolution, and it was carried unanimously.

The retiring Director, Mr. Harold G. Judd, was re-elected; the Auditors, Messrs. Peat, Marwick, Mitchell, & Co., were reappointed, and the proceedings terminated with a vote of thanks to the Chairman and the Directors.

Hear what good cooks are saying—
ABOUT THE NEW
'500'
SERIES
COOKERS
"THE LADIES WILL LOVE THESE GAY COLOURS IN THEIR KITCHENS."
"AUTOMATIC OVEN HEAT CONTROL—SO SIMPLE—SO SURE."
"AND THE SPECIAL VULCAN FEATURE—A GLASS OVEN DOOR."

Personal recommendation by one satisfied user to another has sent the sales of Vulcan Stoves soaring. In the "500" Series Cookers every labour-saving device and every modern improvement have been incorporated; the result is a Gas Cooker up to the minute in perfection and convenience.

- Oven door of double Armourplate Glass, with air space between panes. (Or with enamelled panel door.)
- Automatic Oven Heat Regulator.
- Single back oven burner; bottom flue outlet.
- Patent self-locking grid shelves.
- Housewife planned hot-plates, with covered griller.
- Vitreous enamel finish throughout. In mottled grey or plain colours. Chromium plated fittings.

VULCAN STOVES

THE VULCAN STOVE COMPANY LIMITED, EXETER

Markets and Manufactures

Current Sales of Gas Products

The London Market

June 27.

There are a few changes to record in the prices of Tar Products, to-day's values in the London market being as follows:

Pitch, nominal at about 33s. per ton f.o.b.
Creosote, about 5d.
Refined tar, 3¼d.
Pure toluole, 2s. 1d. to 2s. 2d.
Pure benzole, about 1s. 9d.
95/160 solvent naphtha, 1s. 7d.
90/160 pyridine, about 10s.
All per gallon naked at makers' works.

The Provinces

June 27.

Crude Gas-Works Tar, 16s. to 21s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 31s. 6d. to 32s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. 6d. to 32s. 6d.* Toluole, naked, North, 1s. 7½d. to 1s. 9d. Coal tar, crude naphtha, in bulk, North, 7¾d. to 8¼d. Solvent naphtha, naked, North, 1s. 4½d. to 1s. 5d. Heavy naphtha, North, 1s. 3d. to 1s. 3½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4¼d. to 4¾d.; low gravity, 4¼d. to 4¾d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid, 60's, 2s. 3d. to 2s. 6d. Naphthalene, £13 10s. to £16. Salts, 80s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal; "B" quality unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Scotland

GLASGOW, *June* 25.

Business remains quiet and prices are easy accordingly.

Crude gas-works tar.—Actual value is 37s. to 38s. per ton *ex* works in bulk.

Pitch continues to accumulate and quotations are lower at round 25s. per ton f.o.b. for export, and 23s. per ton *ex* works in bulk for home trade.

Refined tar.—Home demand is about normal at fixed price of 3¼d. to 4d. per gallon f.o.r. naked. Export quotations are unchanged at 3d. to 3¼d. per gallon in buyers' packages at makers' works.

Creosote oil.—Supplies are not too plentiful in this district and prices are steady as under: Specification oil, 5d. to 5¼d. per gallon; low gravity, 6¼d. to 6½d. per gallon; neutral oil, 5d. to 5¼d. per gallon; all *ex* works in bulk.

Cresylic acid.—Business is still slow and values are purely nominal as follows: Pale, 97/99%, 1s. 8d. to 1s. 10d. per gallon; dark, 97/99%, 1s. 6d. to 1s. 8d. per gallon; and pale, 99/100%, 2s. 1d. to 2s. 4d. per gallon; all according to quality *ex* works in buyers' packages.

Crude naphtha commands 5½d. to 6d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 4d. to 1s. 4½d. per gallon and 90/190 heavy naphtha is 1s. 1d. to 1s. 1½d. per gallon.

Motor benzole is valued at 1s. 4d. to 1s. 4½d. per gallon.

Pyridine.—90/160 grade is 10s. 6d. to 11s. per gallon and 90/140 grade is 11s. to 12s. per gallon.

Benzole Prices

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole..	0	9½	to	0	10	per gall. at works
Motor „ ..	1	3	„	1	3½	„ „ „
90% „ ..	1	4	„	1	4½	„ „ „
Pure „ ..	1	8	„	1	8½	„ „ „

Contracts Advertised To-Day

Gas Coal.

Skegness U.D.C. Gas Department. [p. 1,066.]

Gas Consolidation

Net revenue amounting to £29,649, after providing for loan interest and other expenses including taxation, was earned during the year ended May 31, 1938, by Gas Consolidation, Ltd. After adding £3,578 brought forward from last year and deducting the preference dividends for the year and the interim dividends paid on Dec. 1, 1937, on the "A" and "B" ordinary shares, a balance of £17,526 remained available for distribution. The Directors recommend a final dividend of 2½%, less tax, on the "A" ordinary shares, making, with the interim dividend already paid, a total dividend for the year at the rate of 5%, less tax, and a final dividend of 4%, less tax, on the "B" ordinary shares, making, with the interim dividend already paid, a total dividend for the year at the rate of 6%, less tax. This compares with a dividend on the "B" ordinary shares at the rate of 5½%, less tax, for the year ended May 31, 1937, and leaves a balance to be carried forward of £6,004 as against £3,578 brought in. The accounts show that the Company holds investments valued on the basis of cost at £924,615 in thirteen subsidiary gas supply undertakings and it also holds other investments valued at £141,943, including 99,000 deferred shares in Severn Valley Gas Corporation.

Recent Gas Plant Contracts

Messrs. Kirkham, Hulett, & Chandler, Ltd., Gas Engineers, have recently had their tender accepted for the supply, delivery, and erection of new condensers and washer scrubber for the Newcastle-under-Lyme Gas-Works. Other orders of interest recently received are for two of their latest type centrifugal washers for the San Paulo Gas-Works, Brazil, and one centrifugal washer of 4 million cu.ft. per day capacity for the Bombay Gas-Works. The machines are to be used for ammonia extraction, and it is noteworthy that these centrifugal washers give a great extraction efficiency when operating in warm climates.

PROTECT WITH

METROTECT

a bituminous paint producing a pleasant satin black finish with highly waterproof and anti-corrosive properties.

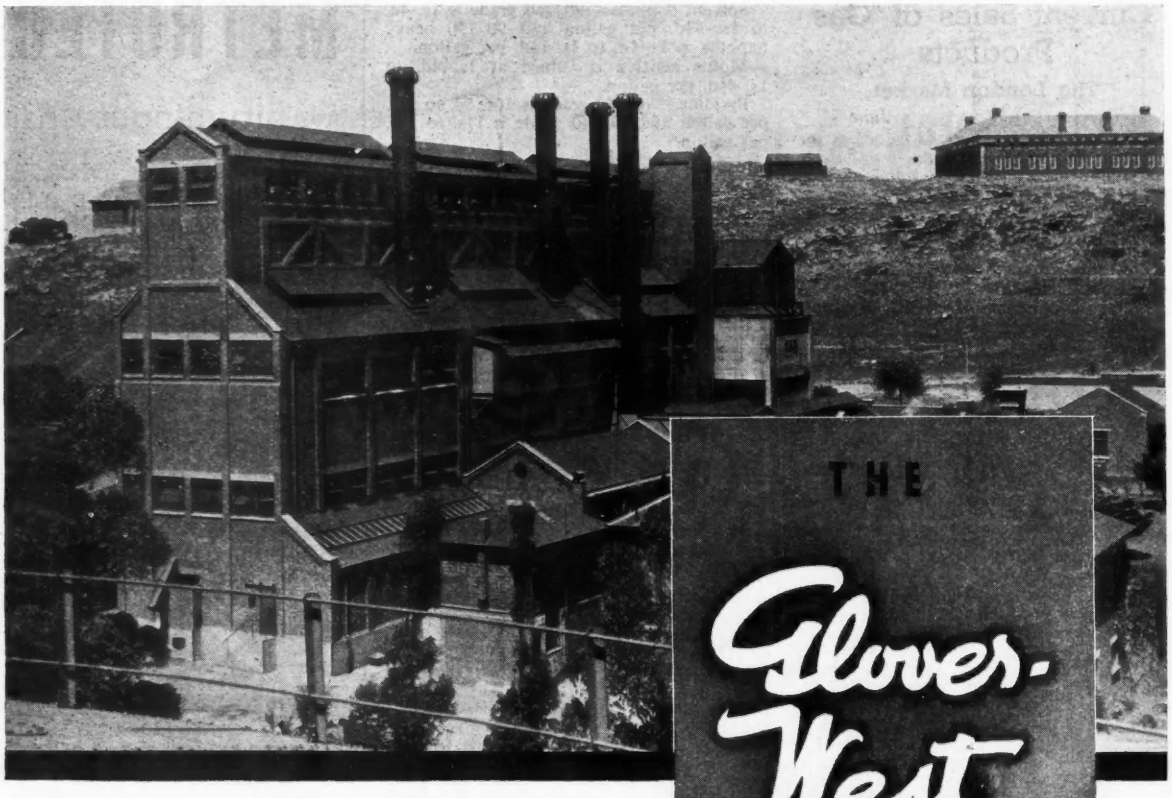
Protects steel-work which is continuously or periodically immersed in water. Does not become brittle on prolonged atmospheric exposure. METROTECT flows freely under the brush and can be applied quickly and without effort even in cold weather.

Prices and further particulars from—

SOUTH METROPOLITAN GAS CO.

PRODUCTS DEPARTMENT,
REGIS HOUSE,
KING WILLIAM STREET,
E.C.4.

● CARBONIZATION IN VERTICAL RETORTS



The modern Glover-West vertical retort plant has behind it the accumulated experience of 64 years constant research and development for the advancement of gas production methods the world over.

● *423 plants have been built or are on order for 223 Gas Undertakings in 24 countries.*

The picture shows the three installations of Glover-West vertical retorts at Johannesburg City Council's Cottesloe gas works. The carbonising unit of the complete modern gasworks ordered for Johannesburg from this company in 1926 has been trebled to meet the rapid growth of demand. The latest extension put to work in 1937 is nearest the camera.

●

WEST'S GAS IMPROVEMENT CO. LTD.,

MANCHESTER: Albion Ironworks, Miles Platting ■ LONDON: Columbia House, Aldwych, W.C.2

GAS STOCKS AND SHARES

Conditions on the Stock Exchange showed a marked change for the better last week. The volume of business increased substantially and with dealers short of supplies prices in all sections made good recoveries. The success of the Government's Defence Loan and the improved conditions on Wall Street were the factors principally responsible for the more optimistic outlook. It is satisfactory to note that despite the poor traffic returns the home rail market shared in the general rise in prices. The leading industrials, especially in the iron and steel groups, were in good demand and several increases of five shillings and over were recorded. Rubber shares were strong on the rise in the price of the commodity, but mining shares, although closing higher than the previous week, became neglected towards the close.

There was no marked increase in the volume of business in the Gas market, transactions for the most part being confined to the stocks of the larger undertakings. The section, however, was not entirely devoid of some share in the brighter conditions, for Gas Light units, which as a rule can be relied upon to reflect the tone of the Gas market, were marked up 6d. to 23s. 3d., after a somewhat long period of reaction. South-Eastern Gas £1 shares also rose 6d. to 23s. In addition Commercial ordinary hardened a point and Alliance and Dublin recovered the three points lost a week ago. The only other changes in the Official List were due to *ex* interest markings. The South Metropolitan Company's 3¼% redeemable debenture stock is now officially quoted and has therefore been inserted in the List.

The usual *ex* interest markings at this time of the year were recorded on the provincial exchanges, while in the Supplementary List the only change of note was a rise of 5 points in the nominal quotation of Southgate 7% maximum stock to 142½.

The accounts of Gas Consolidation, Ltd., show a balance of profit for the year to May 31 last of £29,649, against £24,746. The Directors are recommending a final dividend of 2½% on the "A" ordinary shares, making 5% for the year (unchanged), and 4% on the "B" ordinary shares, making 6% against 5½% last year. The balance forward is raised from £3,578 to £6,004. The "B" shares have been changing hands at 20s., but doubtless some revision in this price will be made this week.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations June 24.	Rise or Fall on Week.
1,767,439	Mar. 7	8	8	Alliance & Dublin Ord. ...	145—155	+3
374,000	June 20	4	4	Do. 4 p.c. Deb. ...	93—108*	−2
558,190	May 9	5	5	Asscd. Gas & Water U'd'ts Ord.	17/6—19/6	...
500,000	,,	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	19/—21/—	...
216,041	,,	⅝-/4	4	Do. 4 p.c. Red. Cum. Pref.	19/—20/—	...
278,590	,,	4	4	Do. 4 p.c. Irred. Cum. Pref.	17/—19/—	...
500,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb. ...	94—99	...
558,890	Feb. 21	7	7	Barnet Ord. 7 p.c.	158—163	...
300,000	Apl. 4	1/4½	1/9⅔	Bombay, Ltd.	24/6—26/6	...
179,915	Feb. 21	9½	9½	Bournemouth sliding scale ...	195—205	...
590,407	,,	7	7	Do. 7 p.c. max. ...	157—162	...
493,960	,,	6	6	Do. 6 p.c. Pref. ...	132—137	...
50,000	June 20	3	3	Do. 3 p.c. Deb. ...	77—82*	−1
262,025	,,	4	4	Do. 4 p.c. Deb. ...	97—102*	−1
335,000	,,	5	5	Do. 5 p.c. Deb. ...	115—120*	...
357,900	Feb. 21	7½	7½	Brighton, &c., 6 p.c. Con. ...	145—150	...
649,955	,,	6½	6½	Do. 5 p.c. Con. ...	128—133	...
205,500	,,	6	6	Do. 6 p.c. 'B' Pref.	125—130	...
855,000	Mar. 7	7	8	British Ord.	138—143	...
100,000	June 3	7	7	Do. 7 p.c. Pref.	140—145	...
350,000	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	,,	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...
450,000	,,	5	5	Do. 5 p.c. Red. Deb. ...	102—107	...
450,000	,,	3¼	3¼	Do. 3¼ p.c. Red. Deb. ...	94—99	...
100,000	22 May'33	6	4	Cape Town, Ltd.	1½—2½	...
100,000	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1½—3½	...
150,000	June 20	4½	4½	Do. 4½ p.c. Deb. ...	60—70*	−5
625,860	Feb. 7	6	6	Cardiff Con. Ord.	120—125	...
237,860	June 3	5	5	Do. 5 p.c. Red. Deb.	105—110	...
98,936	Mar. 21	2/-	2/-	Colombo Ord....	1⅛—1⅞	...
24,510	,,	1/4⅜	1/4⅜	Do. 7 p.c. Pref.	23/—25/—	...
739,453	Mar. 21	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	16/6—18/6	...
296,144	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	23/—25/—	...
1,775,005	Feb. 7	5	5	Commercial Ord.	81—86	+1
620,000	June 3	3	3	Do. 3 p.c. Deb. ...	72—77	...
286,344	Feb. 7	5	5	Do. 5 p.c. Deb. ...	114—119	...
807,560	Feb. 21	7	7	Croydon sliding scale... ...	137—142	...
644,590	,,	5	5	Do max. div.	107—112	...
620,385	June 20	5	5	Do. 5 p.c. Deb.	113—118*	−2
239,000	Feb. 7	5	5	East Hull Ord. 5 p.c.... ...	96—101	...
185,355	Feb. 21	6	6	East Surrey Ord. 5 p.c. ...	118—123	...
176,211	June 3	5	5	Do. 5 p.c. Deb. ...	115—120	...
250,000	Nov. 15	7	4	Gas Consolidation Ord. 'B' ...	19/—21/—	...
250,000	May 9	4	4	Do. 4 p.c. Red. Cum. Pref.	17/6—19/6	...
19,223,324	Feb. 7	5⅜	5⅜	Gas Light & Coke Ord. ...	22/9—23/9a	+-/6
2,600,000	,,	3½	3½	Do. 3½ p.c. max. ...	77—80	...
4,477,106	,,	4	4	Do. 4 p.c. Con. Pref.	100—103	...
2,993,000	Jan. 17	...	3½	Do. 3½ p.c. Red. Pref.	100—103	...
8,602,497	May 23	3	3	Do. 3 p.c. Con. Deb.	78—81	...
3,642,770	,,	5	5	Do. 5 p.c. Red. Deb.	110—113	...
3,500,000	,,	4½	4½	Do. 4½ p.c. Red. Deb.	109—112	...
700,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb.	97—100	...
270,466	Feb. 21	6	6	Harrogate New Cons. ...	118—123	...
157,500	Mar. 21	1/2⅜	1/‡	Hong Kong and China Ord	⅜—1	...
213,200	Feb. 7	6	6	Hornsey Con. 3½ p.c. ...	100—110	...
5,600,000	May 9	8	12	Imperial Continental Cap. ...	115—120	−1
223,130	Jan. 17	3½	3½	Do. 3½ p.c. Red. Deb. ...	88—93	...
285,242	Feb. 21	8½	8½	Lea Bridge 5 p.c. Ord. ...	167—172	...
11,751	Feb. 21	8	10	Maidstone 5 p.c. Cap.... ...	175—185	...
63,480	June 20	3	3	Do. 3 p.c. Deb. ...	70—75*	...
75,000	May 23	†10	†10	Malta & Mediterranean ...	137—142	...
				Metropolitan (of Melbourne)		...
392,000	Apl. 1	5½	5½	5½ p.c. Red. Deb.	99—102	...
231,977	Feb. 21	5	5	M.S. Utility 'C' Cons. ...	99—104	...
968,658	,,	4	4	Do. 4 p.c. Cons. Pref.	95—100	...

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations June 24.	Rise or Fall on Week
360,075	June 20	4	4	M.S. Utility 4 p.c. Deb. ...	95—100*	−2
148,955	,,	5	5	Do. 5 p.c. Deb. ...	113—118*	...
675,000	May 9	†6	†6	Montevideo, Ltd.	70—75	...
250,000	Mar. 7	7½	7½	North Middlesex 6 p.c. Con.	145—150	...
396,160	Feb. 7	5	5	Northampton 5 p.c. max. ...	107—112	...
300,000	Apl. 25	†9	†7	Oriental, Ltd.	150—155	...
468,537	June 3	8	8	Plymouth & Stonehouse 5 p.c.	152—157	...
621,667	Feb. 7	8½	8½	Portsmouth & Gosport Cons.	160—165	...
241,446	,,	5	5	Do. 5 p.c. max. ...	102—107	...
73,350	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
75,000	Feb. 7	...	4	Do. 4 p.c. Pref. ...	95—100	...
114,000	Feb. 7	5	5	Preston 5 p.c. Pref.	106—109	...
247,966	June 3	4	4	Primitiva 4 p.c. Cons. Deb. ...	97—102	...
625,959	Jan. 17	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
15,000	Mar. 21	6	6	San Paulo 6 p.c. Cum. Pref. ...	8¾—9¼	...
441,275	Apl. 25	1/1¼	1/1¼	Severn Val. Gas Cor. Ld. Ord.	20/6—22/6	...
460,810	Mar. 21	-/10⅛	-/10⅝	,, ,, 4½ p.c. Cum. Pref.	19/6—21/6	...
133,201	Feb. 7	8½	5	Shrewsbury 5 p.c. Ord. ...	128—133	...
9,000	June 3	4	‡4	South African Ord.	3¾—4¼	...
1,371,752	Apl. 25	1/2⅔	1/2½	South East'n Gas Cn. Ld. Ord.	22/—24/—	+-/6
871,636	Mar. 7	-/10⅛	-/10⅝	Do. 4½ p.c. Red. Cum. Pref.	20/6—22/6	...
498,818	,,	4	4	Do. 4 p.c. Cum. Pref. ...	18/—20/—	...
450,000	Feb. 7	4	4	Do. 4 p.c. Deb.	100—103	...
150,000	,,	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—98	...
6,709,895	Feb. 7	6	5	South Met. Ord.	104—107	...
1,135,812	,,	6	6	Do. 6 p.c. Irred. Pf. ...	130—135	...
850,000	,,	4	4	Do. 4 p.c.Irred. Pf. ...	97—100	...
1,895,445	June 20	3	3	Do. 3 p.c. Deb. ...	77½—80½	−1
1,000,000	Jan. 17	5	5	Do. 5 p.c. Red. Deb....	109—112	...
600,000	—	—	—	Do. 3¾ p.c. Red Deb....	99—102	...
1,543,795	Feb. 7	6	6	South Suburban Ord. 5 p.c. ...	118—123	...
512,825	,,	5	5	Do. 5 p.c. Pref....	110—115	...
500,000	,,	4	4	Do. 4 p.c. Pref....	95—100	...
250,000	,,	§18/9	3¾	Do. 3¾ p.c. Red. Pref.	98—101	...
888,587	June 3	5	5	Do. 5 p.c. Deb....	115—120	...
250,000	,,	4	4	Do. 4 p.c. Deb....	96—101	...
200,000	Mar. 1	3½	3½	Do. 3½ p.c. Red. Deb.	94—99	...
427,859	Apl. 25	1/2½	9⅔	S. Western Gas & Water Ord.	16/6—18/6	...
160,523	,,	-/10⅜	-/10⅝	Do. 4½ p.c. Red. Cum. Pf.	19/—21/—	...
110,000	June 3	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...
750,541	Feb. 7	5	5½	Southampton Ord. 5 p.c. ...	108—113	...
148,836	June 3	4	4	Do. 4 p.c. Deb.	95—100	...
350,000	Feb. 7	5½	5½	Swansea 5½ p.c. Red. Pref. ...	108—113	...
94,000	June 3	3½	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
1,076,490	Feb. 7	6¾	6¾	Tottenham and District Ord.	126—131	...
409,835	,,	5½	5½	Do. 5½ p.c. Pref....	119—124	...
62,235	,,	5	5	Do. 5 p.c. Pref....	108—113	...
371,850	June 3	4	4	Do. 4 p.c. Deb....	95—100	...
85,701	Apl. 25	6	6	Tuscan 6 p.c. Red. Deb. ...	95—100	...
888,629	Apl. 4	4	6	U. Kingdom Gas Cor. Ord....	18/6—20/6	...
937,743	May 9	4½	4½	Do. 4½ p.c. 1st Cum. Pref.	19/6—21/6	...
500,000	,,	-/1·15	4	Do. 4 p.c 1st Red. Cum. Pf.	19/—21/-	...
745,263	June 3	4½	4½	Do. 4½ p.c. 2nd Non-Cum.Pf.	16/—18/-	...
1,000,000	Mar. 7	3½	3½	Do. 3½ p.c. Red. Deb. ...	96—99	...
373,939	Feb. 7	7	7	Uxbridge, &c., 5 p.c.	133—138	...
133,010	,,	5	5	Do. 5 p.c. Pref. ...	108—113	...
1,371,138	Feb. 7	7	7	Wandsworth Consolidated ...	137—142	...
2,525,768	,,	4	4	Do. 4 p.c. Pref. ...	98—101	...
1,343,964	June 3	5	5	Do. 5 p.c. Deb. ...	115—120	...
383,745	,,	4	4	Do. 4 p.c. Deb. ...	97—102	...
558,342	Feb. 7	7	7	Watford and St. Albans Ord.	135—140	...
200,000	,,	5	5	Do. 5 p.c. Pref. ...	110—115	...
200,000	,,	5½	5½	Do. 5½ p.c. Pref. ...	120—125	...
200,000	June 3	4	4	Do. 4 p.c. Red. Deb.	96—101	...
100,000	,,	3½	3½	Do. 3½ p.c. Red. Deb.	94—99*	...

a.—The quotation is per £1 of stock. * Ex. div. † Paid free of income-tax ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Cont.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations, June 24.	Rise or Fall on Week.
202,152	Mar. 21	5	5	Ascot Ord.	103—108	...
128,182	Dec. 13	5	5	Do. 5 p.c. Pref.	108—113	...
31,035	Mar. 21	...	–/4½	Associated Utilities 4 p.c. Pref.	16/—18/–	...
100,000	Dec. 13	...	3½	Do. 3½ p.c. Red. Deb. ...	95—100	...
17,000	Feb. 21	8	8	Bognor Orig. Ord. 'A' ...	155—165	...
62,210	,,	8	8	Do. New Addl. 'A' ...	155—165	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	155—165	...
37,440	Feb. 7	10	10	Cam. Univ. & Town 10 p.c. max.	190—200	...
125,970	,,	7	7	Do. 7 p.c. max.	135—140	...
39,025	,,	5	5	Do. 5 p.c. max.	97—102	...
96,410	Feb. 7	4½	4½	Cardiff 4½ p.c. Pref.	95—100	...
150,000	Feb. 21	4	4	Croydon 4 p.c. Pref.	98—101	...
130,000	June 20	4	4	Do. 4 p.c. Deb.	97—102*	...
65,000	Mar. 7	7½	8½	Eastbourne 'A' 5 p.c. ...	155—160	...
198,000	,,	6	7	Do. 'B' 3½ p.c.	125—130	...
112,312	,,	5	5	Do. 5 p.c. Pref.	107—112	...
130,000	June 20	5	5	Do. 5 p.c. Deb.	110—115*	—3
24,000	Feb. 21	8½	8½	Great Yarmouth 8½ p.c. max.	43—48	...
59,400	,,	7½	7½	Do. 7½ p.c. max.	33—38	...
51,160	June 3	5½	5½	Do. 5½ p.c. Deb.	120—125	...
152,600	Feb. 21	8	9	Guildford Cons.	167—172	...
54,055	,,	5	5	Do. 5 p.c. Pref.	108—113	...
68,250	June 20	5	5	Do. 5 p.c. Deb.	107—112	...
156,600	Feb. 21	7½	7½	Hampton Court Cons. ...	140—150	...
80,000	Feb. 21	4	4	Lea Bridge 4 p.c. Pref. ...	94—99	...
60,000	,,	6	6	Do. 6 p.c. Pref.	123—128	...
94,876	June 3	4	4	Do. 4 p.c. Deb.	95—100	...
73,620	Mar. 7	8½	8½	Luton Cons. 'A'	160—165	...
107,960	Mar. 21	4	5½	Mid Kent Ord.	8½—9½	...
230,940	Feb. 7	10	10	Oxford & District Ord. ...	198—203	...
47,112	,,	5	5	Do. 5 p.c. Pref.	106—111	...
50,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	108—113	...
126,193	May 9	7½	7½	Peterborough Ord.	135—145	...
64,990	Mar. 7	6½	7½	Redditch Ord....	120—130	...
166,850	Feb. 7	8	8	Romford Ord....	144—149	...
60,000	,,	4	4	Do. 4 p.c. Pref.	97—100	...
44,000	Mar. 21	5	5	Do. 5 p.c. Deb.	111—116	...
25,570	Feb. 7	5½	5½	Rugby 5½ p.c. Pref.	123—128	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	105—110	...
42,750	June 3	5½	5½	Do. 5½ p.c. Deb.	118—123	...
110,950	Feb. 21	8	8	Ryde Ord.	140—150	...
270,086	Mar. 21	7	7	Slough Ord.	128—133	...
21,000	June 20	5	5	Do. 5 p.c. Deb.	110—115*	...
28,872	May 9	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	19/—21/–	...
28,866	Mar. 7	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	18/6—20/6	...
137,730	Feb. 21	7	7	Southgate & Dist. 7 p.c. max.	140—145	+5
62,500	,,	5	5	Do. 5 p.c. Pref.	110—115	...
117,228	Feb. 7	5	7	Swindon Cons.	104—109	...
60,425	June 3	5	5	Do. 5 p.c. Deb.	110—115	...
64,380	June 3	5	5	Torquay & Paignton 5 p.c. Pref.	107—112	...
33,858	May 9	–/2·70b	4½	United Kingdom Gas Corpn. 4½ p.c. 1st Cum. Pref. ...	18/—20/–	...
130,000	Feb. 7	5	8	Wakefield Ord.	118—123	...
81,650	,,	5	5	Do. 5 p.c. max.	101—106	...
82,000	Feb. 21	6	6	Weymouth Ord.	105—110	...
98,384	Feb. 7	6	6	Wolverhampton 6 p.c. Pref.	118—123	...
160,000	June 20	5½	5½	Do. 5½ p.c. Red. Deb.	105—110*	—2
90,000	June 20	5	5	York 5 p.c. Red. Deb. ...	104—109*	...
133,640	Feb. 21	6¼	6¼	Yorktown (Cam.) 5 p.c. Cons.	120—125	...
120,000	,,	5	5	Do. 5 p.c. Pref.	106—111	...
35,000	June 3	5½	5½	Do. 5½ p.c. Deb.	120—125	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, June 24.	Rise or Fall on Week.
347,756	Feb. 7	5	6	Bath Cons.	120—122	...
1,667,250	Feb. 7	5	5	Bristol, 5 p.c. max.	113—115	...
120,420	June 3	4	4	Do. 1st 4 p.c. Deb. ...	98—101	...
217,870	,,	4	4	Do. 2nd 4 p.c. Deb. ...	98—101	...
328,790	,,	5	5	Do. 5 p.c. Deb.	119—122	...
274,000	Feb. 21	5	5	Newport (Mon). 5 p.c. max.	99—101	...
13,200	Mar. 21	7	8⅝	Pontyp'l Gas & W. 10 p.c. 'A'	13—14	...
13,600	,,	5	6	Do. 7 p.c. 'B'	12—12½	...
40,000	,,	5	6	Do. 7 p.c. 'C'	12—12½	...
140,778	Feb. 7	5	5	Weston-super-Mare Cons. ...	110—112	...
64,338	June 20	4	4	Do. 4 p.c. Deb.	93—95*	—1½
33,340	,,	7⅛	7⅛	Do. 7⅛ p.c. Deb.	151—154*	—3

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, June 24.	Rise or Fall on Week.
157,150	Feb. 7	5	6½	Chester 5 p.c. Ord.	107—110	...
92,500	June 20	4	4	Do. 4 p.c. Pref.	95—99*	—1
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	87—90*	—1
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—101*	—1
2,167,410	Feb. 21	6	6	Liverpool 5 p.c. Ord.... ...	124½—125½	...
245,500	June 20	5	5	Do. 5 p.c. Red. Pref. ...	97—102*	—2
306,083	Jan. 17	4	4	Do. 4 p.c. Deb.... ...	100—102	...
106,280	Feb. 7	10	10	Preston 'A' 10 p.c.	202—212	...
188,219	,,	7	7	Do. 'B' 7 p.c.	144—154	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, June 24.	Rise or Fall on Week.
122,577	Feb. 21	8	8	Blyth 5 p.c. Ord.	163½—164½	...
732,000	Feb. 21	5	5	Hartlepool G. & W. Cn. & New	110—112	...
2,061,315	Feb. 7	5	5⅝	Newcastle & Gateshead Con.	22/9—23/3a	...
682,856	,,	4	4	Do. 4 p.c. Pref. ...	99½—100½	...
776,706	June 20	3½	3½	Do. 3½ p.c. Deb. ...	88½—89½*	—1½
277,285	May 9	5	5	Do. 5 p.c. Deb. '43 ...	103—105	...
332,351	Feb. 7	6	6	Sunderland 6 p.c. max. ...	137—139	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, June 24.	Rise or Fall on Week.
542,270	Feb. 21	6	9	Derby Con.	135—140	...
55,000	June 3	4	4	Do. 4 p.c. Deb.	100—105	...
20,000	June 20	5	5	Long Eaton 5 p.c. Pref. ...	10—12*	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	105—110*	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, June 24.	Rise or Fall on Week.
10,000	Feb. 21	10	10	Great Grimsby 'A' Ord. ...	205—215	...
6,500	,,	10	10	Do. 'B' Ord. ...	205—215	...
79,000	,,	10	10	Do. 'C' Ord. ...	195—205	...
1,806,339	Feb. 21	6½	6½	Sheffield Cons.	140—143	...
95,000	Jan. 3	4	4	Do. 4 p.c. Deb.	102—104	...

a The quotation is per £1 of Stock. b Actual. * Ex div.

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TERMS OF SUBSCRIPTION

United Kingdom & Ireland : Advance Rate, 35/- per annum ; 18/- per half year. Credit Rate : 40/- per annum ; 21/- per half year.
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Situations Wanted, 6d. a line (minimum 3/-, about 36 words). Situations Vacant, Plant for Sale and Wanted, Contracts, Public Notices, Educational, &c., 9d. a line (minimum 4/6). Financial Notices, 1/- per line. Box Number, 6d. extra.

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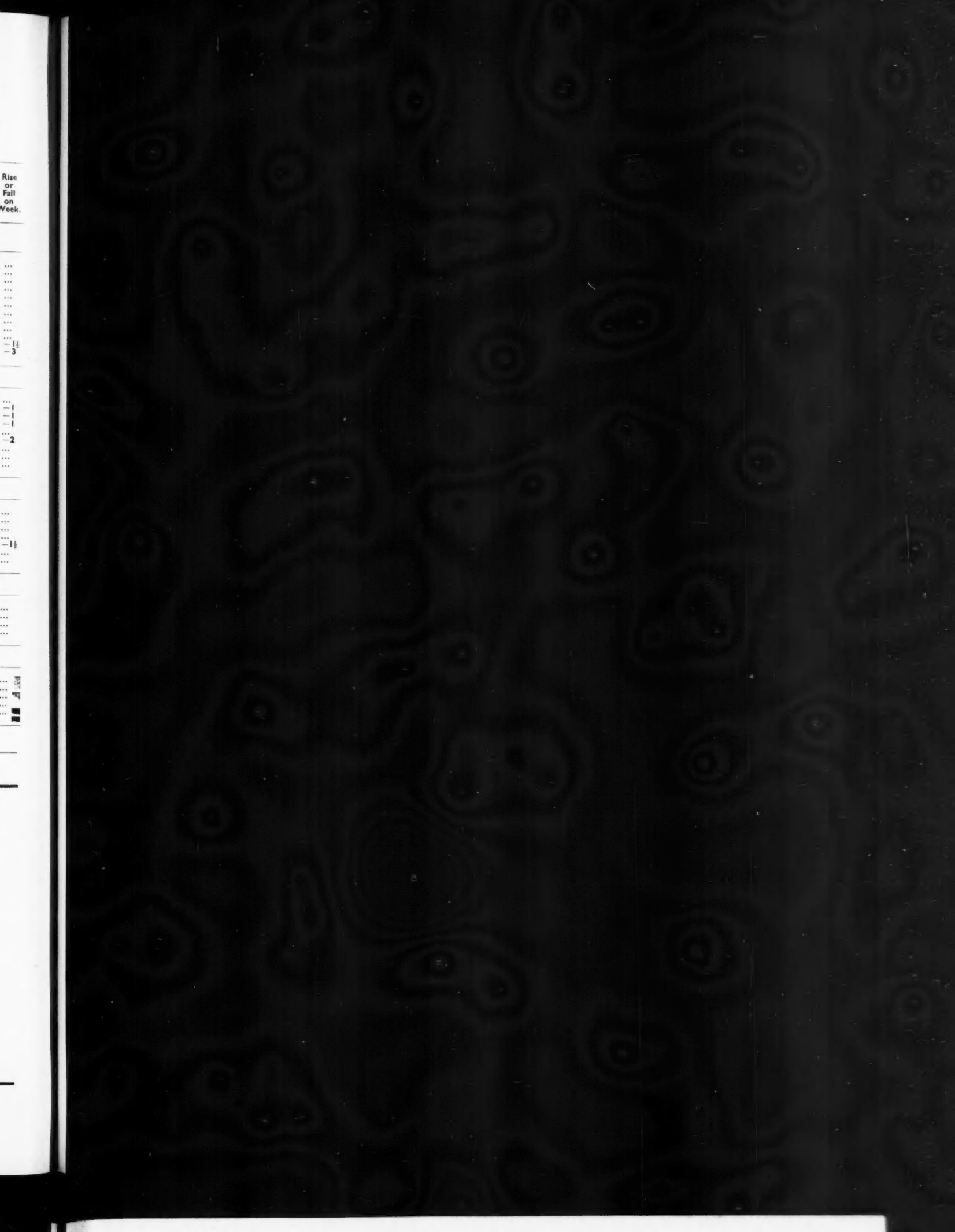
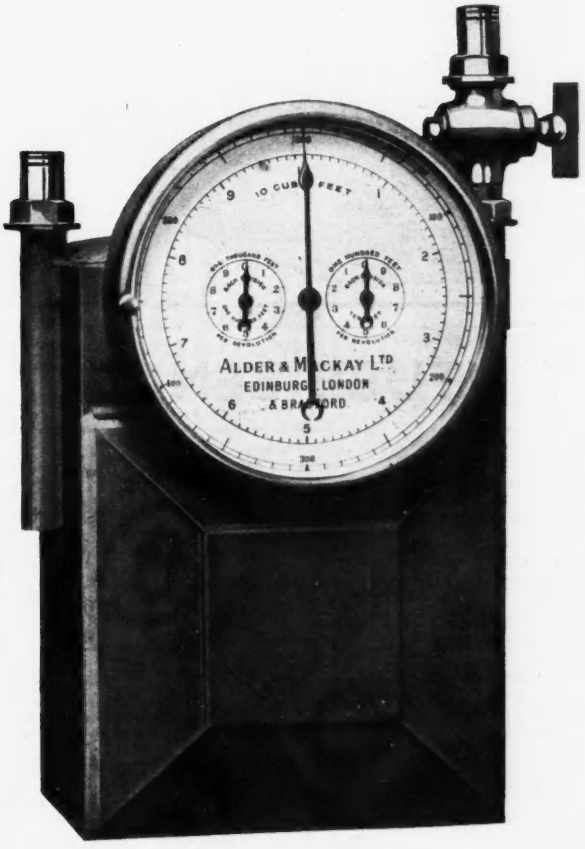


'AEM'
DRY DEMONSTRATION METERS



Specially designed for showroom or cookery demonstration work.

The dial is 9 in. in diameter and a large pointer demonstrates on the outer of two large circles the hourly rate by one minute observation; and on the inner circle 5 cubic feet and 10 cubic feet in the 100 and 200 cubic feet meters respectively.

Available in two sizes for 100 and 200 cubic feet per hour.

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ALDER & MACKAY LTD.

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GAS HOLDERS. OIL TANKS. STEEL BUILDINGS. CAST IRON TANKS. PURIFIERS. MAIN LAYING. PAINTING.
Sub Contractors for any Erection Work.
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GREAT RAVELEY, HUNTINGDON

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BENCH-PORTABLE and POWER MACHINES
TUBES BENT WITHOUT FILLING
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PORTABLE MODELS NEED NO BENCH OR FIXING
TYPE GL 1 THE ORIGINAL LIGHT GAUGE TUBE BENDERS

XL 1 Patent No. 455199

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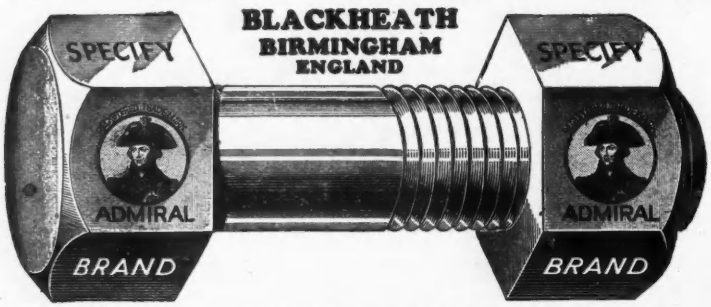

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60% Sulphur absorbed by our

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BRILLIANT BITUMEN COATING

PROTECTS ALL METALS
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DRIES IN 2½ HOURS

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Manufacturers of GAS RETORTS, GLASSHOUSE FURNACE & BLAST FURNACE BRICKS, LUMPS, TILES, and every Description of FIRE BRICKS.

Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.

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ROBERT DEMPSTER & SONS, LTD., ELLAND, Builders of CARBONIZING PLANTS, both Horizontal and Vertical. Manufacturers of CONDENSERS, PURIFIERS GASHOLDERS, &c., also every description of COAL and COKE HANDLING PLANT. *Telegrams:* "Dempster, Elland." *Telephone:* Elland 261 (Private Branch Exchange).

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Specialists

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THE WORLD'S FINEST

FIRE-PROOF NON-CONDUCTING

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of every description

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Tins for Sale to Consumers.
In Bulk for Works Use.

(See also *June* 1, p. 650, *and the "Gas Salesman."*)

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PLANT &c. (Second Hand) FOR SALE and WANTED.

'PHONE 98 STAINES.

FOR SALE—Pipe Screwing Machine up to 6 in. 30 kW. Belliss Steam Generating Set, 220 volts D.C. Paxman Essex Vertical Multitubular Boiler, 9 ft. 6 in. by 4 ft. 6 in., 90 lbs. w.p.

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For further particulars apply to DURSLEY GAS LIGHT AND COKE COMPANY, LTD., DURSLEY, GLOS.

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Three BENZOLE SCRUBBERS 37 ft. 6 in. high by 9 ft. diameter, complete with all Fittings, Valves, &c.

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Three NAPHTHALENE TRAYS, complete with Covering Building.

One 20 in. wide by 175 ft. centres RUBBER BELT CONVEYOR, with Housing.

One Complete DOUBLE UNIT BENZOLE RECTIFICATION PLANT.

One Complete TAR DISTILLATION PLANT.

One PORTABLE COKE SCREENING PLANT.

One COKE OVEN CHARGING MACHINE and RAM.

A number of STORAGE TANKS for TAR, CREOSOTE, OIL, and ACID, &c.

Various TAR and LIQUOR PUMPS.

Considerable quantity of 24 in. and 30 in. diameter M.S. PIPING, in various lengths.

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ASSISTANT Manager, employed by important Chemical Works, seeks similar responsible Position with Organization where actual Experience of Tar and Benzole Products Manufacture, Plant Extension, and Supervision of Labour would be of service. Clean record.

Address, No. 8,875, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

WORKS Manager, age 41. Seventeen years' Experience in Design, Manufacture, and Installation, all types of Gas Governors. City and Guilds Medal, Gas Distribution. Free in one month.

Address, No. 8,877, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

COMPETENT Designer of Domestic Gas Cooking and Heating Appliances, with Initiative and Exceptional Inventive Ability, seeks appointment as Chief; 20 years' experience.

Reply No. 8,876, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

APPOINTMENTS VACANT.

APPLICANTS for the Position of ENGINEER, MANAGER, and SECRETARY to a Lancashire Gas Company advertised under No. 8,842 are THANKED, and are informed THAT AN APPOINTMENT HAS BEEN MADE.

THE Oriental Gas Company, Ltd., invite Applications for the Position of WORKS SUPERINTENDENT at their Calcutta Works. Applicants should be about 30 years of age and in excellent health, and must have First-Class Experience in Carbonizing and Erection and Maintenance of all Works Plant and Machinery.

Salary Rs.800, rising ultimately to Rs.1,000 per month, with free furnished quarters on Works. Passage paid out and home. First agreement for a period of 5 years.

Full particulars, together with *copies* of recent Testimonials, to be sent to the SECRETARY, ORIENTAL GAS COMPANY, LTD., FINSBURY HOUSE, BLOMFIELD STREET, LONDON, E.C. 2.

WANTED — General Foreman. Working Foreman required for 42 Million Works. Must be experienced in the Control and Maintenance of Woodall-Duckham Vertical Retorts, Horizontal Retorts, Waste Heat and Cornish Boilers, Tar Plant Machinery, and General Gas-Works Plant. Experience in the laying of mains and services would be an advantage. Must be of good character, reliable, and hard working. Wages £4 per week, free house, and coal.

Apply, by letter, stating Age and whether Married, and giving full particulars of Experience. Enclose *copies* of Three recent Testimonials to:

C. B. STANIFORTH,
Engineer and Manager.

Gas Company Offices,
Ely Gas Company, Ltd.,
Ely, Cambs.

WANTED — Assistant Works FOREMAN, must be Skilled Practical Engineer. Preference given to one with knowledge of Guest Gibbons Stoking Machine. Wage £4 per week.

Apply, with *copies* only of recent Testimonials, to R. G. LUXON, ENGINEER, MANAGER, and SECRETARY, GUERNSEY GAS LIGHT COMPANY, LTD.

APPOINTMENTS VACANT.
(Continued.)

BOROUGH OF STAFFORD.
(GAS DEPARTMENT.)

APPOINTMENT OF DISTRICT REPRESENTATIVE.

APPLICATIONS are invited for the above Appointment from Persons Experienced in Canvassing and Advising Consumers on the Selection of Gas Apparatus, &c.

Applicants should have Experience in Sales Methods, and should preferably be in possession of The Institution of Gas Engineers' Certificate in Gas Supply and the British Commercial Gas Association Certificate in Gas Salesmanship, or equivalent qualifications.

The duties of the District Representative will include the Organization of Gas Sales Propaganda, Demonstrations, Lectures, &c.

The Salary paid will be in accordance with Grade III. of the Council's Grading Scheme, commencing at £220 per Annum and rising by annual increments of £10 to £250 per Annum. The first increment will become effective as from the 1st April, 1939. Applicants should not be over forty years of age.

The post will be designated under the Local Government and Other Officers' Superannuation Act, 1922, and the successful candidate will be required to pass a Medical Examination.

Applications, accompanied by *copies* of Three recent Testimonials, stating Age, Qualifications, and previous Experience, to be forwarded to Mr. T. H. Poulson, A.M.I.Mech.E., F.C.S., Gas Engineer and Manager, the Gas-Works, Chell Road, Stafford, not later than 16th July, 1938.

T. BROUGHTON NOWELL,
Town Clerk.

Borough Hall,
Stafford,
June 27, 1938.

COUNTY BOROUGH OF SOUTHPORT.
(GAS DEPARTMENT.)

APPLICATIONS are invited for the Position of SHIFT FOREMAN at the Crowlands Gas-Works. Wages, £4 14s. per week. Applicants must be less than 40 years of age, and must have Practical Experience with Vertical Retorts and Carburetted Water Gas Plant, also General Gas-Works Practice, and be able to control workmen.

The position will be a designated one under the Corporation's Superannuation scheme, and the successful Candidate will be required to pass a Medical Examination.

Applications, stating Age and Experience, together with *copies* of two recent Testimonials, endorsed "Shift Foreman," to be delivered to the undersigned not later than Saturday, the 9th July, 1938.

J. HERBERT CLEGG,
Engineer and Manager.

91, Eastbank Street,
Southport,
June 25, 1938.

EDUCATIONAL.

UNIVERSITY OF MANCHESTER.

FACULTY OF TECHNOLOGY.

PARTICULARS of Degree Courses in General Chemical Technology, Chemical Engineering, Metallurgy and Assaying, Fermentation Processes (including Brewing), Foodstuffs, Fuels, Colouring Matters, and Electro-Chemistry, and of the Post-Graduate Diploma Course in Chemical Engineering, will be supplied on request by THE REGISTRAR, COLLEGE OF TECHNOLOGY, MANCHESTER, 1.

CONTRACTS OPEN.

SKEGNESS URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the Supply of about 6,500 Tons of LARGE WASHED GAS NUTS, preferably South Yorkshire, to be delivered as required over the Twelve Months ending August 31, 1939.

The Committee reserve the right to fix the whole or part of the Contract with one or more Contractors.

The lowest or any Tender not necessarily accepted.

Tenders to be sent in a sealed envelope, marked "Tender for Coal," and addressed to Ivor M. Cule, Esq., Clerk to the Skegness Urban District Council, Town Hall, Skegness, and to be received not later than the first post on Monday, July 4, 1938.

F. YOUNG, A.M.I.C.E.,
Engineer and Manager.

Gas-Works,
Skegness.

COMPANY NOTICES.

SOUTH SUBURBAN GAS COMPANY.

NOTICE is Hereby Given that the TRANSFER BOOKS relating to the ORDINARY and PREFERENCE STOCKS of this Company WILL BE CLOSED from the 8th July to 21st July, both days inclusive.

By Order of the Board,

T. BROWN,
General Manager and Secretary.

Chief Office:
Lower Sydenham, S.E. 26,
June 23, 1938.

COMMERCIAL GAS COMPANY.

NOTICE is Hereby Given that the TRANSFER BOOKS of this Company, so far as they relate to ORDINARY STOCK, WILL BE CLOSED from the 4th July to 3rd August, both days inclusive.

By Order of the Board,

E. H. HARMAN.
Secretary.

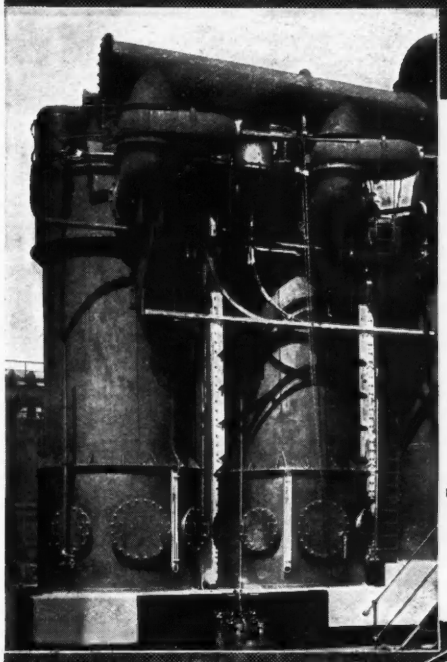
Offices:
Stepney, E. 1,
June 24, 1938.

PATENTS.

MEWBURN, ELLIS & CO.,
CHARTERED PATENT AGENTS
AND TRADE MARK AGENTS
70 & 72, Chancery Lane, London, W.C.2.
Telegrams: "Patent, London." Phone: 0437 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

KINGS PATENT AGENCY, LTD.
(Director, B. T. King, Patent Agent). Advice, Handbook, and Consultations free. 1938 Inventors' and Patentees' Diary, 1s. 9d., post free.—146a, Queen Victoria Street, London, E.C.4. Phone: City 6161.

ELECTRICAL PRECIPITATION of TAR FOG from Coal and Coke Oven Gases



By the use of this method the complete removal of tar fog in one operation ensures clean apparatus, clean effluent, and greatly reduced back pressure, with the result that the installation of an Electrical Detarrer becomes a profitable investment.

Two Electrical Detarrers, each having a capacity of 425,000 cubic feet of coke oven gas per hour installed for Messrs. Stewarts and Lloyds Limited, at their Corby Works.

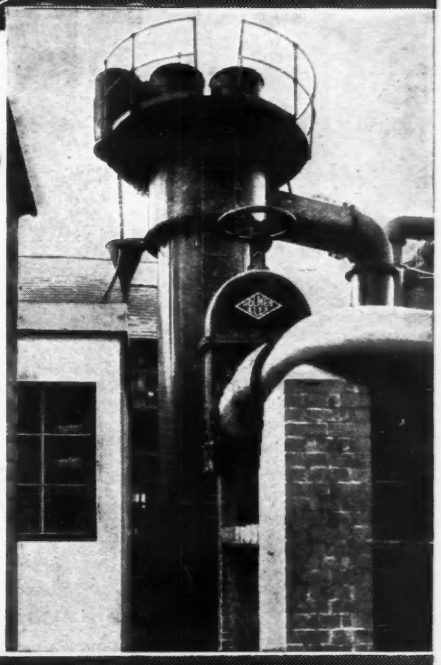
FURTHER, THE HOLMES ELEX DESIGN PROVIDES

PAT. Nos. 4171/36 & 25356/36

SIMPLICITY OF CONSTRUCTION ensuring minimum initial cost, very low running and maintenance costs and easy access to all sections of the plant.

SAFETY IN OPERATION assured by simple interlocks, which makes it impossible to approach either Detarrer interior or Electrical Equipment whilst the plant is in operation.

Electrical Detarrer capacity 3,000,000 cubic feet of coal gas per day, installed for City of Plymouth Gas Department, Devonport.



THE SOCIETY OF BRITISH GAS INDUSTRIES 1905

W · C · HOLMES & CO. LTD.

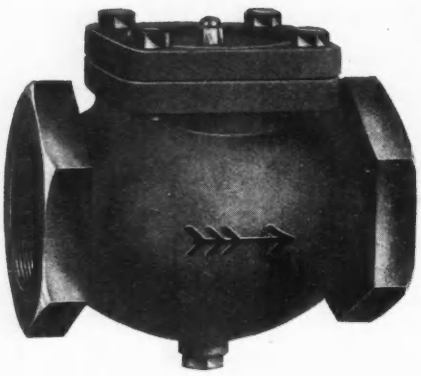
HUDDERSFIELD
WHITESTONE IRONWORKS
Telephone: HUDDERSFIELD 1573
Telegrams: "Holmes Huddersfield"

HOLMES
FOUNDED 1850

LONDON
119 VICTORIA STREET · S·W·1
Telephone: VICTORIA 9971
Telegrams: "Ignitor, Sowest"

C147

This is the valve for preventing back-pressure of air on meter and service pipes when high-pressure air is used with gas for furnace work, etc. . .



THIS patent Back-pressure Valve has advantages not possessed by others and meets all the requirements of Board of Trade Regulations. The internal valve proper is very light and offers very little resistance to the gas pressure. It is, however, sufficiently stiff to withstand considerable back-pressure, and a dash-pot is provided to prevent chattering. Drain plug is fitted for withdrawing any condensation, and provision is made for lifting the valve from its seat should it become stuck owing to naphthalene or other deposits. 9 sizes, ¾" to 6" inlet and outlet. Prices on application.

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"Keith Blackman" Back-pressure Valve

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Printed by the Chancery Lane Printing Works, Ltd., for WALTER KING, LIMITED, 11, BOLT COURT FLEET STREET, LONDON, E.C. 4.—Wednesday, June 29, 1938